KANSAS GEOLOGICAL SURVEY
OPEN-FILE REPORT 42-2

MINERALS AND POWER TO WIN THE WAR AND DEVELOP THE WEST

by

H. L. Ickes

Kansas Geological Survey
1930 Constant Avenue
University of Kansas
Lawrence, KS 66047-3726

KGS
OF
42-2

UNITED STATES
DEPARTMENT OF THE INTERIOR
DIVISION OF INFORMATION
WASHINGTON

February 27, 1942.

Mr. Robert M. Dreyer, Geologist,
State Geological Survey of Kansas,
The University of Kansas,
Lawrence, Kansas.

My dear Mr. Dreyer:

Attached are copies of the Minerals and Power Expansion Program to Win the War and Develop the West and the complete war program of the Department of the Interior as announced by Secretary Ickes.

I trust this will fill your request of February 24 asking for a copy of the exploration program. Please note that the press release dated Monday, February 16, contains a breakdown by states of the proposed expansion program while the accompanying mimeographed copy of the letter sent to Senator O'Mahoney by Secretary Ickes carries complete details of the proposed program according to the specific mineral involved.

Please feel free to call upon us for any further information regarding these programs to mobilize the natural resources of the Nation.

Sincerely yours,

Robert Gross

Robert Gross,
Writer and Research Assistant.

Enclosure 2293931.

177202

MINERALS AND POWER

to

WIN THE WAR

and

DEVELOP THE WEST

Following is a letter by Secretary of the Interior Harold L. Ickes to Senator Joseph C. O'Mahoney of Wyoming, chairman of the Senate sub-committee which has been investigating the use of the resources of the West.

The letter outlines a mineral and power development program designed to meet immediate war requirements and later to serve the Nation in peace. It is calculated to help meet the enormous demands of the President's war production schedule, make the United States independent of foreign minerals during the emergency, save millions of tons of shipping desperately needed for the war program, release Navy vessels which might be assigned to convoy these tons of vital war materials to safety, and look toward the rounded development of the West.

177202

THE SECRETARY OF THE INTERIOR

Washington

February 6, 1942.

My dear Senator O'Mahoney:

You have requested the Department of the Interior to make further specific recommendations concerning mineral and power developments in the West. You ask particularly for my views on the financing of mineral and industrial development, on avoiding monopolization, and on the development of additional facilities to meet war requirements which later would serve us in peace.

I am glad to have this occasion to present the Department's present program and views to you and to the Committee which has been working in this field.

The program includes enough large-scale development of our low-grade manganese ores, through processes developed by the Bureau of Mines, to produce 429,000,000 tons of steel. It includes large-scale development of aluminum and magnesium. To these other metals are being added constantly. It includes methods for seeing to it that these metals are promptly and efficiently brought into use for the Nation's needs. The program includes sample low-cost power developments which would add 1,480,000 kilowatts to the Nation's war generating capacity, and a larger proportion of firm power than any other group of projects of similar cost outside of the coastal states.

MINERALS FOR WAR

The Department is, and steadily has been, for a far greater use of the mineral resources of the Nation than has yet been made.

As you know, we must now dip into the bottom of the basket and use our high-cost, low-grade ores in many instances. Many of these have been unusable because no processes were developed which allowed for their use, or because the possessors of the processes were not interested in their extensive use.

The problem of securing wide and general use of the new processes represents one of three major bottlenecks in our mineral production.

The Department makes four proposals to help break this first bottleneck:

(1) The Bureau of Mines, which has done so much to develop means for the processing of low-grade manganese ores, of alunites and magnesites, should be instructed by Congress to push its work to a triple speed basis on these and other minerals. (a) Since the national output of iron and steel might be greatly increased by the making of sponge iron by gaseous reduction of iron ores and subsequent smelting in electric furnaces, plants are proposed to utilize this process. This process is adaptable to the production of iron in small units at scattered situations where there are deposits of ore otherwise suitable but too small in size to support large blast-furnace operations. (b) Other American metallurgical industries are based on the utilization of high-grade ores which are being exhausted. Pilot plants are proposed for the development of processes for economical extraction of such metals as copper, lead, and zinc from our abundant resources of low-grade ores. (c) Pilot plants for the production of the alkali and alkaline earth metals—lithium, sodium, strontium, barium, and beryllium are also proposed. Beryllium, especially, is rapidly increasing in importance in the manufacture of alloys, and at present little is produced in the United States. Development of lithium on a commercial basis would make possible the fabrication, by rolling, of magnesium alloys on the same basis that aluminum is rolled. It would aid in producing non-corrosive magnesium sheets. (d) An electrodevelopment laboratory is proposed, to be situated in the Pacific Northwest, in order to further the full and efficient use of power generated at Bonneville and Grand Coulee, and to utilize the mineral resources of the areas within reach of power from these dams to produce needed materials.

(2) The Department is now examining all enemy alien patents and processes with a view to utilizing them for the war effort. It should be free to test and, if necessary, use these processes.

(3) Congress or the President should authorize the Bureau of Mines to examine all American-owned patents and processes for minerals needed for winning the war and the experience records on them. They should be made available for the confidential use of the Bureau of Mines. After such inspection, the Bureau of Mines should be able to speed up production of minerals greatly by recommending the most effective processes. At this time, no private company or individual should be allowed to withhold from the Government anything which will cut down the time necessary to get out materials for the war program.

(4) The Bureau of Mines stands ready to provide every user of processes developed by the Department, or recommended by it, with part of the time of a skilled engineer, who can aid in preparing plans for equipment and can assist in the expert and efficient use of the equipment to produce satisfactory results.

The second major bottleneck is in the production both of ores which had been considered strategic, such as tin, antimony, mercury, and nickel, and ores that had not previously been considered strategic, such as copper, zinc, lead and iron, and also of chromium which has now assumed greater importance. Today steel mills are closing down for lack of iron. Our expected copper production is also far from meeting the demands of the war program. Our Philippine chromium supply is now lost to us for a while, and our expected domestic production will be only a fourth of our 1943 needs. Zinc and lead may lend themselves to further development. Of both of them we need great amounts.

(5) I propose to you, therefore, that Congress authorize exploration work by the Bureau of Mines and the Geological Survey for copper, iron, chromite, zinc and lead. The Stillwater, Montana, chromium development is an outstanding success as a result of the investigations and reports by the Geological Survey and the Bureau of Mines, as is the tungsten development at Yellow Pine, Idaho. Although it is not well to arouse hopes that may be disappointed, there is a possibility that, with the assignment of 75 additional geologists and engineers to the ten to fifteen relatively undeveloped copper areas, 75 additional engineers and geologists to iron, and 100 additional engineers and geologists to chromites, zinc and lead, sufficient available materials may be marked out to warrant development. At least we will stand a better chance of victory than if this work is not done.

(6) There is now great difficulty in securing engineers, under present competitive salaries in private industry. If these additional geologists and engineers are authorized, I propose to appeal to the colleges and universities to give the Government a year's service of their engineers for this purpose.

It is well recognized that all mining camps where large production has been made contain ores that have not been mined because their grade proved too low under then existing conditions to sustain

commercial operations. The exploration of such low-grade areas has usually been limited also by the failure to find substantial bodies of high-grade ore within them. The Bureau of Mines would therefore give first consideration to such areas. It should be understood that, under intensive exploration, new discoveries of high-grade ore could be expected from parts of these low-grade areas. A few of the areas which would be given attention may be cited as follows:

COPPER

California

Engels and Spring Garden Districts

Nevada

Battle Mountain, Yerington and Robinson Districts

Utah

West Mountain District

Arizona

Verdi, Globe, Pioneer, Miami, Mineral Creek, Ajo, Silver Bell and Warren Districts

Colorado

Bonanza District

New Mexico

Central, Fierro, Burro Mountains and Lordsburg Districts

Tennessee

Ducktown District

Washington

Chelan District

LEAD

Idaho

Shoshone and Bonner Districts

Utah

West Mountain, Rush Valley, Blue Ledge and Tintic Districts

Montana

Summit Valley District

Colorado

Leadville, San Juan and Rico Districts

New Mexico

Willow Creek District

Missouri-Oklahoma-Kansas

The Tri-State District and southeast Missouri

Washington

Metaline Falls District

ZINC

Idaho

Shoshone District

Nevada

Pioche District

Utah

West Mountain and Blue Ledge Districts

Montana

Summit Valley District

Colorado

Leadville, Eureka and Rico Districts

New Mexico

Willow Creek District

Oklahoma-Kansas-Missouri

Tri-State District

Missouri

Southeastern District

Wisconsin

Platteville District

Tennessee

Jefferson and Washington Districts

Oregon

Lane District

Washington

Metaline Falls District

IRON ORE

Alabama, California, Minnesota, Michigan, New Jersey, New Mexico, New York, Oregon, Pennsylvania, Tennessee, Utah, Washington, Wisconsin and Wyoming.

CHROMITE

Based on exploration during past 2-1/2 years: Alaska, California, Montana, Oregon, Washington.

It should be remembered that up to the present the strategic minerals investigations of the Bureau of Mines have not included the common metals mentioned above, except chromite. Therefore, information as to discoveries of them has not been received. It is expected that, as soon as investigations here proposed are started, information will be received of other areas worthy of consideration for additional exploration.

(7) I propose further that the records of all mineral developments in the areas above listed be made available confidentially to the Geological Survey and the Bureau of Mines in order that they may utilize the information to speed up the exploration work.

You will remember that the cooperation of the oil companies in making available to the Department the records of wild-cat drillings in the New Mexico area led the Department to the discovery of the potash resources which made American agriculture and industry independent of German imports.

The third major bottleneck has been that of securing capital for the development of short-lived or low-grade ore bodies and for mills or smelters to develop such low-grade materials. Testimony before your Committee indicates that the bottleneck has not been broken by any of the existing agencies.

To break this bottleneck I suggest the following:

(8) After the President has found the greater production of any mineral to be essential, and after the War Production Board has requested the Department of the Interior to procure such minerals in adequate quantities, the Department should be given the power to certify to the Reconstruction Finance Corporation for loans to companies or individuals seeking to develop low-grade ores or to construct mills or smelters for the production of these essential war minerals. Prior to such certification the Department would assure itself of the adequacy of the resources and of the technical processes to be used. It is better equipped to do these two things than any other agency.

(9) After certification, loans are to be made for the development of mines and the erection of custom plants or smelters.

(10) If private capital or competent management is not interested in developments of considerable risk, due to the low-grade or short life of the ore or the dubious post-war competitive situation of a custom mill or refinery based on low-grade ores, I believe that--rather than see the war program fail--it would be better to allow the Government to develop the mines or custom mills or refineries, and to be given the same long-term contracts that are offered to private citizens.

I do not look on this tenth proposal with enthusiasm. As I told your Committee, my conception of the function of Government is to help people over hurdles so that they can do things for themselves. The certification and loan provisions provide a means to get them over the hurdles, as would the processes worked out by the Bureau of Mines which might be made available to everybody. I would be reluctant to see the Department undertake the operation of custom smelters or of mines, but I would be far more reluctant to see any of our fighting men killed for lack of the extra planes or ships or guns that might be produced through the operation of mines or of smelters which private capital does not care to risk.

In the certification of companies or individuals by the Department to the Reconstruction Finance Corporation you, or the Committee, may wish to include some special recognition of the possibility that local residents are more likely to desire the continued operation of a given development in the post-war years than non-residents, or than those financially tied to the fortunes of plants located elsewhere in the Nation. Since the West has been handicapped in the

development of its combined mineral and industrial life in so many ways, and has no desire to repeat the boom and ghost-town cycle of the last war, I see no objection to some such preference to local residents, and to small companies, possibly in the form of a certification of a company or individual or group of resident individuals acting cooperatively, provided that they have obtained a given percentage of the sum necessary for construction and operation. It is important to have an arrangement which is administratively workable.

In accordance with your request, I will later forward to you a draft of mineral and power development legislation intended to break the financial bottleneck. It will contain also certain other provisions to which I wish to call your attention.

(11) First, provisions for the operation of pilot plants and further explorative work.

(12) Second, a Minerals Policy Board of nine, including representatives of the Secretaries of War and Navy and the Chairman of the National Resources Planning Board, to advise the Secretary on mineral developments.

(13) Third, the initiation of regional marketing studies, which will include ascertaining the capacity of local markets to absorb products fabricated from local minerals, and provide for the exploration of the possibilities of correlating the development and production of the national mineral resources with demand.

(14) Fourth, a leasing system which will tend to prevent the non-use of needed mineral resources. I believe that much of the usual objection to this system will be removed by the certification provisions of the draft legislation which I have discussed above. Valid claims for needed minerals can be brought into use more rapidly by a combination of leasing and certification than by the present claim system. I am attaching (Exhibit 1) a supplemental statement in support of this specific recommendation.

(15) Fifth, provisions for the examination and, if warranted, the analysis of mineral samples.

I have, for convenience sake, grouped specific proposals for plants for or developments of some of the minerals under six separate heads, I - Manganese, II - Alumina, III - Magnesium, IV - Chromium, V - Vanadium, and VI - Phosphates.

It must be remembered that the Department's program is a dynamic one. Every improvement in a process which is discovered and tested satisfactorily is immediately incorporated into the program, and less effective processes are eliminated. This should be kept in mind throughout. When the Bureau of Mines discovers processes still better than its present ones, which already open up vast resources of hitherto unavailable materials for our war effort, it will propose them.

I. MINERAL DEVELOPMENT PROGRAM - MANGANESE

The Department's proposals for manganese development in the United States will produce approximately enough manganese metal during the next five years to cover four years' supply of steel for the war program.

(16) This is to come from many beds of ore through the following milling plants, which the Department recommends be established:

Las Vegas, Nevada,
Delta, Utah, Custom Mill,
Philipsburg, Montana, Custom Mill,
Parker Dam, Arizona-California,
Artillery Peak, Arizona,
Batesville, Arkansas,
Deming, New Mexico,
Cuyuna Range, Minnesota.

(17) Also, by hydrometallurgical processes the following amounts of manganese can be produced in plants which the Department recommends be built:

Garfield, Utah,
Las Vegas, Nevada,
Cuyuna Range, Minnesota.

In addition, there should be established a plant for the treatment of the very large manganese deposit at Chamberlain, South Dakota. For the treatment of this ore a plant utilizing the matte smelting process is suggested:

The total over-all production of manganese will be sufficient to produce 429,280,000 tons of steel in five years.

The equivalent of this metallic tonnage in high-grade ore from Brazil or Cuba would be 5,563,300 long tons, which would require 1,112,660 tons of shipping per year to get it to this country over five years. The production of metal from our low-grade ores would save this shipping to the Nation.

The life of the properties serving these mills and plants may not be long. One will last 2.6 years at maximum production, 350 days a year, a second and third, 3 years, another 2.8 years. The short lives of most of these properties have made private capital reluctant to undertake the mills or plants necessary for their development.

The above amounts of metals indicated by metallic-manganese (Mm) will be obtained from the ore bodies which have been surveyed by the Mining Division of the Bureau of Mines. The following list indicates estimated tonnages of ore and metallic-manganese available:

	Tons Ore	Tons Mm*
Las Vegas, Nevada	2,850,000	520,000
Delta, Utah	740,000	118,200
Philipsburg, Montana	500,000	150,000
Parker Dam, Ariz.-Cal.	100,000	30,000
Artillery Peak, Ariz.	3,000,000	330,000
Batesville, Arkansas	1,500,000	336,000
Deming, New Mexico	150,000	22,000
Cuyuna Range, Minnesota	6,000,000	600,000
Pioche, Nevada	5,000,000	675,000
Tintic, Utah	100,000	20,000
Battle Mountain, Nevada	38,000	5,624
Valmy, Nevada	38,000	6,080
Chamberlain, South Dakota	50,000,000	1,000,000
	70,016,000	3,812,904

These tonnages will come from many scattered properties in many states except for the Las Vegas, Artillery Peak, Philipsburg, and Cuyuna Range deposits. The ore bodies are listed in the individual sheets which are presented below as exhibits.

---

* Metal in the ore body, not recovered tonnage.

The job confronting us was to find ways of utilizing our low-grade manganese ores. The Bureau of Mines has licked this job by working out two methods which can be used efficiently on different types of ores. The first is by milling, which is relatively inexpensive, both as to plant and operating costs. Various forms of flotation or gravity methods are used to increase the percentage of manganese in the recovered product. The second is by hydrometallurgical processes. These dissolve the manganese away from the inert material, and it is eventually recovered by chemical or thermal methods designed to produce the highest grade product obtainable in the treatment of such ores. The milling methods produce a 40 to 48% manganese, while the hydrometallurgical methods produce a 60 to 65% product. In both cases the final product must be smeltered before it can be used in the steel industry.

The hydrometallurgical plants proposed above include a 35 ton per day electrolytic manganese plant at Las Vegas. This type of manganese is in great demand by many war plants, and all of the electrolytic manganese now being made at Knoxville, Tennessee, is going to war plants. This electrolytic manganese requires four kilowatt-hours per pound.

I am attaching (Exhibits 2-12) summaries of the plant cost, operating cost, probable production and ore resources for each of the 12 plants which the Department is proposing.

II. MINERAL DEVELOPMENT PROGRAM - ALUMINA

The great increase in the aluminum program from 1,600,000,000 pounds to over 2,000,000,000 pounds has accentuated our need for greater danger-free sources of the raw material for aluminum production. All raw materials, bauxite or alunite or aluminous clays, have to be transformed into alumina before they can be converted into aluminum, which is done by the electrolytic process.

The alkali or Bayer process now used is applicable only to bauxite. However, the major reserves of our country are in the form of clays, leucites, and other aluminous minerals occurring in the western states.

The Bureau of Mines has been working for years on a process which would make these materials a source of alumina. After much effort a small plant using such a process was authorized by the Defense Plant Corporation, but construction has only now been started. Further investigation by the Bureau has developed an improved process which eliminates expensive machinery, 20% of the total plant cost. This process breaks down into two parts, one of which is essentially a roasting process, which can be done cheaply, and an acid process which is more expensive. This first part produces alum. The important fact here is that alum can be produced out of many shales, natural alums, leucites, glaucanite sands, feldspars, and aluminum-bearing tailings from porphyry copper deposits. It may therefore be possible for many small producers of alum to sell their product to a centrally-located plant which would put the alum through further treatment to produce alumina.

This may make it possible for small companies in various parts of the country, by using a simple rotary kiln, to produce alum and sell it to one or more centrally-located plants, which would then put the alum through further treatment to produce alumina.

(18) The Department recommends, as part of its program, that this combination process be adopted by the War Production Board for future plants. The Department will work out details as to the production of alum and will announce them later. In order that the full engineering details of this process can be made available to private industry, it is advisable that some further pilot plant runs be made. These pilot plant runs should include clays and leucites as sources of supply.

III. MINERAL DEVELOPMENT PROGRAM - MAGNESIUM

The Bureau of Mines has given special attention to the development of methods for the production of metallic-magnesium from readily available raw materials. The Bureau has investigated most of the proposed processes for the production of metallic-magnesium, and has developed three processes which are believed to have merit as possible means of increased magnesium production.

The first of these, on which the Bureau has been working since 1938, involves the carbon reduction of magnesium from magnesium oxide and its condensation by an oil spray. This process differs from the Hansgirg process developed in Europe by the use of an oil spray

rather than a large volume of gas for condensation. This Bureau process was successfully tested at the Ford Motor Company in a plant producing 50 pounds per day for several months. The Permanente Corporation, using the Hansgirg process, has modified its procedure by making use of oil to prevent the explosion of fine magnesium powder between the condensing and redistillation steps. The plant at Permanente has therefore already adopted some of the operating technique developed by the Bureau's investigations.

In addition to oil condensation, the Bureau has developed, on a laboratory scale, and is now putting to a pilot plan test, a process in which molten lead is used to condense the magnesium vapor from the electrothermic reduction furnace. The magnesium is removed from the lead by electrolysis, which is simpler and cheaper than the distillation process employed in either the Bureau oil condensation process or the process at Permanente.

Still a third method of producing magnesium, which is under pilot plant test in the Bureau's laboratories at Boulder City, involves the use of an electrolytic cell to which magnesium oxide may be added directly in the same way that aluminum oxide is added to the electrolytic cell for the production of aluminum. This process would avoid the necessity for the chemical regeneration of the electrolyte, which is necessary to either the British electron process which is to be used by Basic Magnesium, Inc., at Las Vegas, Nevada, or to the Dow process, which is most widely used in this country.

The Bureau's further investigation of these processes is actively under way. They will permit the production of magnesium by processes not privately controlled and will insure the continuation of the magnesium industry after the war period on a non-monopolistic basis.

The raw material for most magnesium processes so far considered has come from sea water or from relatively scarce deposits of magnesite, which is pure magnesium carbonate. The Bureau in its pilot plant at Boulder City has developed processes for the utilization of widely occurring rock formations containing magnesium. These impure magnesium minerals are subjected to a chemical process which produces magnesium oxide in a form highly suitable for the manufacture of magnesium metal by any of the processes which have been proposed. At the present time pilot plant tests are being rushed to completion on the basis of a method for producing magnesium from the plentiful dolomite deposits near Sloan, Nevada. These deposits are only twenty miles from the Basic Magnesium Company's plant near

Las Vegas, Nevada, and if the process can be successfully demonstrated, this company will be saved the necessity of bringing magnesite from a deposit more than 300 miles distant by a truck road, or more than 1,000 miles distant by railroad. The saving of this amount of transportation and rubber tires, if it be done by truck, is of the utmost importance at this time. Similar developments as to raw materials for magnesium in other parts of the country are under way.

(19) The Department recommends that it be aided in speeding up the work on the processes and resources which is now under way.

IV. MINERAL DEVELOPMENT PROGRAM - CHROMIUM

The Bureau has long recognized the importance of making available metallic chromium and chromium concentrates of standard grade from our domestic deposits. Large deposits of low-grade chromite are known to occur in Montana and in other western states. These chromites can be concentrated by mechanical means to a certain degree, but the product so obtained is not up to the standard quality heretofore imported for the production of ferrochrome, which is used in a wide variety of steels, especially stainless steel. The Bureau has developed processes, now being tried out on a pilot plant scale at its Boulder City laboratory, by which these low-grade chromite concentrates can be converted into metallurgical grade concentrates for the electric furnace production of ferrochromium, and other processes by which the highest purity chromium can be obtained by an electrolytic process. These processes for the treatment of domestic chromium ores, when fully developed, will enable us to obtain every type of chromium or chromium alloy which is necessary in steel manufacture.

Mining investigations by the Bureau have already shown chromium reserves, made up mostly of the low-grade chromites which have just been discussed, capable of producing a million tons of metallurgical grade concentrates. Our annual requirements in 1941 were 250,000 tons of this grade. Additional chromium concentrates required for refractory and chemical purposes amount to 500,000 tons but these may be of lower grade.

(20) Additional exploration work and the completion of pilot plant testing of processes should be pushed at all possible speed. Additional funds should be appropriated for this purpose.

V. MINERAL DEVELOPMENT PROGRAM - VANADIUM

The known sources of vanadium in this country are not sufficient to supply the tool steel needs of the war program. Apparently foreign sources are unable to increase their supply raddily. A considerable number of small partially explored deposits are known, which are made up of complex ores for which satisfactory treatment methods have not been worked out.

(21) While further exploration of carnotite deposits, particularly in Colorado and Utah, may lead to some further developments, it is also recommended that the deposits of metallic vanadates be explored, and methods of vanadium recovery be worked out. When this is done, it is recommended that custom mills should be built for the treatment of ores from a very considerable number of small deposits. This program will probably supply most of the war needs. If additional vanadium is required, it can be obtained from the very large known reserves of titaniferous magnesites which occur particularly in California. Japan secures most of her vanadium from this type of ore. Investigations of methods of recovery from this source are included in the Bureau's program.

VI. MINERAL DEVELOPMENT PROGRAM - PHOSPHATES

The Department has created a Consulting Committee on Northwestern Phosphates, which includes representatives of the Department of Agriculture and the Tennessee Valley Authority, as well as distinguished scientists outside of the Government. Its purpose is to find out at what prices the farmers of the West will really be able to utilize triple superphosphate from the Large Northwestern deposits, which they need badly, which processes can be best used to beneficiate these deposits, and the cost of plant and operations under both the electric and acid processes.

The construction of a plant using the electric process can produce elemental phosphorus for military purposes. The construction of a plant using this acid process can produce some vanadium, which is a critical material.

(22) The work of this Committee is well under way, and the Department recommends that Congress utilize the analyses of the

Committee, when completed, as to superphosphate and phosphorus, or, alternatively, vanadium; and that if warranted, Congress support the construction of such a plant as may be proposed for the war effort and for the service of the farmers in the West.

POWER FOR WAR

The minerals considered above, and all of the others which we must have for the war program, need some electric power for their processing. They need some for their fabrication. The foresight of Congress and the Administration has provided us with the Bonneville-Grand Coulee system, which can produce as much firm energy per new kilowatt installed as new installations of 1.6 kilowatts can produce in many of the Eastern sections. Now it is essential, as you suggest in your letter, that proper consideration also be given to the needs of the states in safer areas behind the mountains as well as to the needs of the coastal states.

(23) I wish therefore to submit for your consideration some 17 samples of power projects available for development in the western states. These are only a few of many which could be constructed, and which have been named to your Committee. More detailed studies of them will be necessary, and, as you know, the time element is largely determined by the bottleneck in manufacturing equipment. These sample projects offer 1,480,000 kilowatts of installed capacity, and a maximum total annual production of 10,190,800,000 kilowatt-hours. This is roughly sufficient to produce a billion pounds of aluminum or magnesium annually. That production would equip 40,000 four-engine bombers with the necessary aluminum each year. Of course, it should not all be used for aluminum alone, but for other equally vital defense needs such as zinc, copper, and other western minerals.

The steam plants included in the list will utilize western fuel resources. In the instances where they are linked with hydro projects, they will firm up the output and make the energy more valuable and useful for war industries requiring a continuous flow of power.

These power projects can be self-liquidating. Costs have now increased so much over January, 1940, prices that these projects

would cost $350,603,000 instead of $271,713,000, their January, 1940, cost. With normal costs the energy produced would result in self-liquidating returns, within 40 years, of between 2.64 mills and 3.06 mills per kilowatt-hour. These are costs at the existing or probable load centers. They are comparatively low.

(24) It is therefore my proposal that the abnormal increase in construction costs, the difference between the January, 1940, and the present costs, be paid off, but that the repayment be postponed until after the end of the customary 40-year period, during which the normal cost of the projects would be liquidated.

I wish to call your attention to the fact that the major bottleneck in the manufacture of generating equipment is in the forging of shafts. That is where the great delay occurs. The hydroelectric projects proposed here, in proportion to their firm power, may press less upon the bottleneck of forgings than many other projects which might be considered. This is due to the fact that these Bureau of Reclamation projects, on the average, have higher heads and a more continuous water supply than others and therefore require smaller wheels than other projects with correspondingly smaller shafts. My information is that the smaller shaft forgings are less of a bottleneck than the larger ones, as they can be secured from 16 or 17 manufacturing concerns instead of from only 4 firms, as in the case of the larger shafts.

The power contributed by these projects carries a very high ratio of firm to secondary power, and is therefore more valuable for the electrometallurgical industries than power resources which have a greater amount of secondary power and less firm power per dollar of investment. Operated under war conditions the firm power is 8,996,000,000 kilowatt-hours, and the secondary 1,195,100,000 kilowatts. However, this is on a basis of 100% load factor for the steam plants during the emergency. But even with the steam plants at 80% load factor, the ratio of firm power is very high.

In calling these projects to the attention of the Director of the Budget, I pointed out that, in my opinion, the following considerations should prevail in determining projects that should be constructed immediately:

1. Only the projects essential for the successful and rapid prosecution of the war should be constructed now.

2. Projects should be constructed in the order of their time of availability and their strategic and war industry location.

3. No non-war features should be constructed at the present moment, but the usefulness of projects for multiple-purposes in the post-war period should be considered an advantage over other projects.

4. Power project allocations should be considered in the light of the fact that the Western States will be called upon for increasing amounts of production and processing of low-grade minerals.

5. Other things being equal, the power developments which will pay for themselves and lead to the development of the regions where they are located are sounder Government investments than others.

6. Other things being equal, low-cost energy is more desirable than high-cost energy.

7. Those projects less subject to the bottleneck of shaft forgings should be given preference over others at this moment, and until that bottleneck has been broken; and

8. Firm power is more valuable than flash stream peak power for most of the war industries, particularly for the electrometallurgical war industries.

All of the hydroelectric projects proposed here, together with the steam auxiliary plants, would contribute to the irrigated agricultural output of the West necessary to meet war needs for food and fibre and would aid in maintaining the stability of the West in the post-war period. Irrigation is the major one of the other purposes listed.

Studies have been made of each of the 17 projects, as well as of several others which are not now presented because of their higher costs. These studies are attached (Exhibits 13-29). I will simply present here a brief summary of each:

1. Pilot Knob, California. This is a small project on the All-American Canal which would utilize a head of 51 to 62 feet, and have an installed capacity of 33,000 kilowatts. It would produce an initial firm output of 130,000,000 kilowatt-hours per year; the secondary power output would average 96,000,000 kilowatt-hours per

year. It would aid in meeting the power shortage in the Southern California-Southwestern Arizona area. The normal cost of this development would be $4,378,000. It could be constructed in about 12 months, and would produce power at 1.4 mills, normal cost, and 1.6 mills present cost, without deferment.

2. Sacramento plant, Sacramento, California. This is a 50,000 kilowatt steam plant which is an essential part of the Central Valleys project. The Sacramento Municipal Utility District would provide a power market for about 100,000 kilowatts for the Central Valleys system, centering around Shasta and Keswick dams on the Sacramento River. Power shortage in the area for war purposes is expected. This plant, together with one at Newark, California, is necessary to make available as firm energy the maximum amount of the output available at Shasta and Keswick dams. The normal cost of this plant would be $5,000,000; the present cost would be $6,250,000. At normal costs on a 100% load factor basis energy could be produced at 2.8 mills per kilowatt-hour and 3.6 mills on a 60% load factor basis; at present costs, without deferment, for 3.1 mills, and 3.9 mills.

3. Newark plant, Newark, California. This is a 150,000 kilowatt steam plant, close to the San Francisco bay area which provides the major power demand for the output of the Central Valleys generating system. Power shortage in the area for war purposes is expected. Study of the water records indicates that this plant, together with the one at Sacramento, are necessary to make available the maximum amount of firm power. The normal cost of this plant would be $15,000,000; the present cost $18,750,000. At normal costs on a 100% load factor basis energy could be produced for 2.8 mills per kilowatt-hour and 3.6 mills on a 60% load factor basis; at present costs, without deferment, for 3.1 mills, and 4.0 mills.

4. Scriver Creek, Mountain Home, Idaho. This is a 120,000 kilowatt multiple-purpose installation. The upper plant would have a net head of 390 feet, and an installed capacity of 30,000 kilowatts, producing a firm output of 214,000,000 kilowatt-hours annually. The lower plant would have a net head of 770 feet, an installed capacity of 90,000 kilowatts, and an annual firm output of 414,000,000 kilowatt-hours. The combined firm output would be 628,000,000 kilowatt-hours; the secondary output would be about 20,000,000 kilowatt-hours. Expected mineral developments and alumium reduction indicate a power shortage in the area in several years. The normal cost of this project would be $15,858,000; the present cost $21,000,000, including transmission lines connecting with Black Canyon and Anderson Ranch power plants

of the Bureau of Reclamation and the Idaho Power Company at Mountain Home, and a line to Stibrite to supply power for tungsten, and a line to Challis for tungsten. The project would provide means to assist in the ultimate development of the 400,000 acres of irrigable land in the Mountain Home area. The normal cost per kilowatt-hour would be 1.63; the present cost, without deferment, 1.96 mills.

5. Palisades, Snake River, Idaho. This is a multiple-purpose plant of 30,000 kilowatt capacity. The reservoir would extend across the state line into Wyoming. The average annual output would be 230,000,000 kilowatt-hours, the firm output 131,000,000 kilowatt-hours. Increased demands for power for copper are expected to close down on the power from Montana that has been going to Utah, and increased demands in Idaho are expected to tighten the amount that the Idaho Power Company has been able to transfer to Utah. It is believed that the entire firm output would be absorbed immediately following construction. The project would be economically feasible only if a considerable allocation of construction cost would be found to be chargeable to other purposes such as irrigation and flood control. The normal cost, after such allocations, would be $9,300,000; the present cost, after allocations, $11,900,000. The normal cost per kilowatt-hour would be 2.3 mills.

6. Kortes, Kendrick Project, Wyoming. This is a multiple-purpose plant of 30,000 kilowatt capacity on the North Platte River. It would produce 101,000,000 kilowatt-hours of firm energy annually and 61,000,000 kilowatt-hours of secondary, which would be marketed in the area served by the Government's interconnected power system, which has been utilizing its present capacities to their fullest extent. It is believed that the war needs of the area will utilize all power available, since normal growth indicates that a peak capacity of at least 45,000 additional kilowatts could be absorbed in the area in 1944. The capacity of the Kortes plant could be absorbed before the Colorado-Big Thompson hydroelectric plants could be ready for operation. The normal costs, including transmission lines would be $7,045,000; the present costs $8,310,000. The normal cost per kilowatt-hour would be 3.1 mills, the present cost, without deferment, 3.7 mills.

7. Heart Mountain, Shoshone River, Wyoming. This is a 10,000 kilowatt multiple-purpose hydro-plant, with a net head of 265 feet linked with a Reclamation project under construction. The annual

energy output would be 71,000,000 kilowatt-hours, of which 46,500,000 kilowatt-hours would be firm energy. Even before the war program the power deficiency in five years in the Colorado-Wyoming--Western Nebraska area was estimated at between 75,000 or 125,000 kilowatts. It is believed that there will be an increase in mining in the State during the emergency, and that after the emergency the power would be absorbed in the normal growth of the interconnected systems. The normal cost of the project would be $815,000; the present cost $1,060,000. The normal cost per kilowatt-hour would be 1.44 mills, the present cost, without deferment 1.66 mills per kilowatt-hour. Firm energy in this area now has a value of 4 mills and secondary 1.8 mills.

8. Canyon Ferry, Missouri River, Montana. This is a 35,000 kilowatt multiple-purpose development, with an expected annual energy output and effect of 150,000,000 kilowatt-hours. This output could aid in the increased copper and chrome production and reduction in the area. There is already a power shortage in this section of Montana which is expected to increase with the war program. The normal costs would be $11,569,000, the present costs $15,000,000. The normal costs per kilowatt-hour would be 3.06 mills; the present costs, without deferment, 5. mills.

9. Mystic, Truckee Storage Project, California-Nevada. This is a multiple-purpose project of 22,000 kilowatts capacity, and an annual production of 59,000,000 kilowatt-hours of firm capacity and 33,000,000 kilowatt-hours of secondary capacity. Of this 11.8 and 3.4 million kilowatt-hours would have to be used to replace Farad energy, leaving 47,200,000 kilowatt-hours of firm energy and 29,600,000 kilowatt-hours of secondary power, a total of 76,800,000 kilowatt-hours. Increase in mining and milling, as well as agricultural growth in the area is expected. Large blocks of power have been purchased from the Pacific Gas and Electric system, the output of which is now heavily in demand for the California area. The normal cost of the project would be $4,686,000; the present cost would be $6,650,000. The normal cost per kilowatt-hour would be 3.5 mills, the present cost, without deferment, 4.6 mills.

10. Dewey, Colorado River, Utah. This is a 150,000 kilowatt capacity multiple-purpose project essential for the development of the Utah area. It would be expected to produce 842,000,000 kilowatt-hours of firm power annually and 145,000,000 kilowatts of secondary, a total of 987,000,000 kilowatt-hours during each of the first 40 years of its life. Together with transmission lines to Salt Lake City,

and substations there and at Provo, Utah, the normal cost of the project would be $38,700,000, the present cost $50,000,000. The expansion of the pig-iron and steel industry, now definitely planned, and the expected location of magnesite and alunite deposits will use up the available power rapidly, and the increased Montana copper production will cut into the present supply of power furnished to this area from Montana. Lack of cheap power has held back the war development of the Utah region, and for this reason both the Dewey and the Lake Utah projects are proposed. The normal cost of the energy would be 2.2 mills per kilowatt-hour, the present cost, without deferment, 2.7 mills.

11. Lake Utah Plant, Lake Utah, Utah. This is a steam plant of 50,000 kilowatts capacity, which could provide an annual output of 438,000,000 kilowatt-hours at 100% load factor, running down to 263,000,000 kilowatt-hours on a 60% load factor. Much of the energy consumed in Utah has been imported from Idaho and Montana, which are expected to have shortages of their own due to the increase in mining and industrial activities. The Utah area is having very considerable mining and processing demands made upon it by the war program. Magnesium developments, if located near the rich brine areas of Great Salt Lake, would use approximately 100,000,000 kilowatt-hours for every ten million pounds. The cost of electric power is an essential determinant in the location of magnesium processing. The normal cost of this plant would be $5,250,000, the present cost $6,650,000. Energy could be produced on a 100% load factor basis at normal costs at 2.64 mills, at present costs, without deferment, at 3.1 mills. On a 60% load factor basis at normal costs at 3.7 mills, at present costs at 4 mills.

12. Fort Collins Plant, Colorado-Big Thompson project, Colorado. This is a steam plant of 100,000 kilowatts capacity, with an annual energy production of 876,000,000 kilowatt-hours at a load factor of 100%, running down to 526,000,000 kilowatt-hours at a load factor of 60%. It would be part of the multiple-purpose development at Colorado-Big Thompson, now under construction. It would firm up and increase the value of the hydroelectric power to be produced by this project. The availability of larger blocks of power at low cost would stimulate mining operations needed for the war effort, and aid in the development of lead, zinc, molybdenum, tungsten, and vanadium resources of the State. The normal cost would be $10,000,000, the present cost $12,500,000. The normal cost per kilowatt-hour would be 2.8 mills on a 100% load factor basis, and 3.6 mills on a 60% load factor basis; the present costs, without deferment, would be 3 mills, and 4 mills.

13. Plant on Missouri River, near Bismarck, North Dakota. This is a multiple-purpose steam plant of 25,000 kilowatts capacity, with transmission lines to interconnect with the Fort Peck power system. It would be expected to produce 219,000,000 kilowatt-hours on a 100% load factor. The lignitic coal of North Dakota would be used as fuel, and produce lower-cost power more rapidly than hydroelectric development of the Missouri River in North Dakota. It would be connected with the terminus of the Fort Peck system at Williston, North Dakota. Operating in conjunction with the Fort Peck system it could supply a large block of firm power, and serve for irrigation purposes after the war mining needs of the area have been met. The normal cost of the project would be $3,250,000, the present cost $4,125,000. The normal cost per kilowatt-hour on a 100% load factor would be 3.1 mills, on a 60% load factor, 4.1 mills; the present costs without deferment, would be 3.5 mills and 4.7 mills.

14. Mobridge, South Dakota. This is a multiple-purpose steam plant of 25,000 kilowatts capacity, which could produce 219,000,000 kilowatt-hours on a 100% load factor, running down to 131,000,000 kilowatt-hours on a 60% load factor. The plant could be built more rapidly than the various hydroelectric projects under discussion, and serve the manganese, chromium and other mineral deposits in the State. Normal growth in the State indicates a shortage within a few years, warranting more firm generating capacity even exclusive of war needs. The proposal made for the development at the manganese deposits at Chamberlain would increase this shortage. Coal mines of North and South Dakota could be used to provide fuel, and over 100,000 tons per year would be used. The normal cost of the plant, together with lines and substations, would be $3,250,000, the present cost $4,125,000. The normal cost per kilowatt-hour on a 100% load factor would be 3.1 mills, on a 60% load factor 3.5 mills, the present cost, without deferment, would be 4.1 and 4.7 mills per kilowatt-hour.

15. Albuquerque Power Development, Albuquerque, New Mexico. This is a multiple-purpose steam plant of 25,000 kilowatts capacity, which could produce 219,000,000 kilowatt-hours on a 100% load factor, running down to 131,000,000 kilowatt-hours on a 60% load factor. The plant could play an important part in the defense program by supplying power to cantonments and war industry plants in New Mexico. After the war it could firm up and increase the value of secondary energy from the hydroelectric plants with which it will be interconnected. It would use over 138,000 tons annually of local coal as fuel. It could be connected with the Elephant Butte power plant of the Bureau of Reclamation, and thereby materially increase the power supply for

the entire area; and could also connect later with a future development of the San Juan Chama power system, which is primarily an irrigation development. The normal cost of the plant, together with transmission lines and substations would be $3,740,000. The present cost would be $4,205,000. The normal cost per kilowatt-hour on a 100% load factor basis would be 3.2 mills, on a 60% load factor basis 4.2 mills. Present cost per kilowatt-hour would be 3.5 and 4.8 mills.

16. El Paso Plant, Rio Grande Project, El Paso, Texas. This is a steam plant of 25,000 kilowatts capacity, which could produce annually 219,000,000 kilowatt-hours, on a 100% load factor, decreasing to 131,000,000 kilowatt-hours on a 60% load factor. This block of power would aid in supplying the mineral requirements of Southwestern New Mexico, which are centered around Silver City, New Mexico. At present the Elephant Butte plant has only 15,000,000 kilowatt-hours not committed, and these are dependent upon the absence of drought. Increase in mining activities is dependent upon other power sources. This plant could be a war-time auxiliary to the Rio Grande project, and a post-war standby for Elephant Butte. The need for increased production of copper, lead, and zinc should be met with additional power in this area. It could also supply power to the new El Paso refinery of Phelps Dodge. The normal cost of the plant would be $2,874,000, the present cost $3,600,000. The normal cost per kilowatt-hour on a 100% load factor basis would be 3.0 mills, on a 60% basis, 3.8 mills. The present cost, without deferment, would be 3.3 mills and 4.4 mills.

17. Bridge Canyon, Colorado River, Arizona. This is a project of an ultimate 600,000 kilowatts capacity, located above Lake Mead. It could produce the largest single block of low-cost power in that area. It would suffer some depletions from up-stream developments and diversions, and silting over a period of years. Prior to the completion of the Dewey Reservoir, it could produce annually 2,190,000,000 kilowatt-hours of firm power, after that 3,370,000,000 kilowatt-hours, an average of 3 billion kilowatt-hours. It would produce also an average of 720,000,000 kilowatt-hours of secondary power, a total of 3,720,000,000 kilowatt-hours. While drilling is still in process, it is believed now that the dam could be constructed in four years. It would be interconnected with Boulder, Davis and Parker power plants and used for industrial purposes in Arizona, Nevada and Southern California. One transmission line would connect it with Phoenix, Arizona via Prescott, and three lines would connect it with Davis dam. A total of 600,000 kilovolt-amperes of substation capacity would be required at the ends of the lines.

The present power market, including the needs of Basic Magnesium at Las Vegas, will absorb all of the available power capacity of Boulder and Parker and all new and normal loads will have to be supplied from Davis, which will not be available until 1945, and Bridge Canyon. The normal costs of construction, including lines and substations, would be $132,000,000. The present cost would be $172,000,000. The normal cost per kilowatt-hour would be 1.9 mills, the present cost, without deferment, is 2.5 mills.

I wish also to ask the Committee to give consideration to a recommendation by the Bonneville Power Administration.

(25) The Bonneville Power Administration recommends the consideration of certain projects which could go into action fast, and which would require relatively small amounts of vital materials for the return in energy that they would give.

The list below indicates the Administration's estimates of the time required for construction, of the cost, and of the energy which could be made available:

1. High priorities on the six Coulee units (L-4, L-5, L-6, L-7, L-8, and L-9) would provide, on the average, an additional firm energy production of 1,536,800,000 kilowatt-hours.

2. High priorities on the shafting of the last four Bonneville units (B-7, B-8, B-9, and B-10) might gain as much as 500,000,000 kilowatt-hours.

3. The elevation of Ross Dam, on the Skagit River, belonging to the City of Seattle, could be done within 1-1/2 or 2 years at a cost of about $6,000,000 and without requiring any new generating capacity, and would add 50,000 kilowatts of firm capacity, with an annual production of 438,000,000 kilowatt-hours of firm energy. There would also be 1,000,000 acre feet of additional storage. The cost per kilowatt-hour would be approximately 3/4 mill at the busbar.

4. The acquisition of the Rock Island Dam of the Puget Sound Power and Light Company, already under consideration in the process of acquisition of that Company's properties, would make available 120,000 kilowatts capacity within 2 years. The dam is already built, and the additional units could be secured rapidly because they are 15,000 kilowatts capacity each. The present cost would be $10,250,000.

It would produce 990,000,000 kilowatt-hours of energy. The energy would cost about 3/4 mill at the busbar.

In addition, the Bonneville Power Administration wishes to point out the following possibilities for increased power production:

1. The additional six units (making a total of 15) at Coulee Dam, of 648,000 kilowatts capacity could be installed if manufacturing shop capacity were available. Each takes approximately 2-1/2 years to construct. If available they would produce an average of 860,000,000 kilowatt-hours of secondary energy 90% of the time. All of the capacity would be usable 50% of each year, which would produce 2,400,000,000 kilowatt-hours of secondary energy. The cost would be $23,396,000. The cost per kilowatt-hour would be approximately 3/4 mill.

2. Nisqually Dam, belonging to the City of Tacoma, could provide 90,000 kilowatts capacity with production of 377,000,000 kilowatt-hours of firm energy. It would cost $11,000,000, and could be constructed, according to the Administration's estimates, in 3 to 4 years. The cost per kilowatt-hour about 1.5 mills at the busbar.

3. Umatilla Dam is included in the present River and Harbors bill, and is being considered by Congress.

I have little to add at this time to my earlier statement to the Committee that, for the wider development of the West, there should be more fabrication of raw materials into finished products and more diversification of industries. Before and since that time I have been urging upon the war agencies that they give consideration to locating magnesium and other power consuming loads such as zinc, and not simply aluminum reduction, on the public projects in the West; and that they plan the aluminum fabricating plant program so that the plants will be useful at the end of the war instead of tieing them up to the closing-down policies of Alcoa and other companies with Eastern interests. I have also urged constantly that all such plants be located in advantageous positions rather than in disadvantageous locations from the point of view of the over-all development of the West, the desirability of keeping operations going in the post-war period, and the possibility that smaller units could be purchased and operated by local capital and citizens.

Unless adequate consideration is given to these matters, the result will be that at the end of the war the people of the West will

be quite as much at the mercy of the decisions of the larger companies of the country as to what plants they will close down as, in the past, they have been dependent upon the decisions of these companies not to engage in refining or fabricating in the West.

The measures I have suggested above, under the heads of mineral development and power for the West, would do something to put individuals and smaller companies into action for the war and for a few years afterward. While that would be something definite toward winning the war, it would not be any great underpinning for the post-war situation in the West. I believe that the decisions and actions now being taken will increase the spread of large industry control of the resources of the West and of the Nation rather than the contrary. Possibly recommendations on this score would come with more grace from the Committee than from myself.

I do not wish to let this occasion go by without pointing out to your Committee that the Department of the Interior has been doing a great deal to encourage greater war production. We have been urging the construction of more refineries to produce 100% octane gas, essential for our military planes. We have been encouraging the exploration for oil so that further resources may be available to prevent a shortage during the war years. The Department's oil program will be announced separately. The Division of Power has been endeavoring to untangle the power maze at Boulder Dam in order to supply the needs of the Basic Magnesium plant, to forward contracts for power for aluminum and magnesium, to work out plans for new developments, and to see to it that the power resources in the area in which the Department has important power developments are put to the best possible use.

Power being produced or planned by the Bureau of Reclamation is vital in overcoming the supremacy of the Axis powers in power production. In 1940, according to recent reliable reports, the Axis nations had at their command 230 billion kilowatt-hours of electric energy. This compares with 144 billion kilowatt-hours produced by all plants in the United States in that year.

The Bureau of Reclamation in 1942 will produce a minimum of 5-1/2 billion kilowatt-hours, and by 1944, under the present schedule, will be producing 18 billion kilowatt-hours annually.

If authorized to expand its program and if provided with funds and priorities, the Bureau could increase its capacity to 4,000,000

kilowatts by 1944, or an estimated annual output of 20 billion killowatt hours.

Strategically located for the development of western resources in 13 western states, Bureau of Reclamation hydroelectric plants in operation on January 1, 1942, had a total installed capacity of 1,144,462 kilowatts. The Bureau's current program of projects and installations under construction and authorized will almost triple this capacity by July 1, 1945. With high priorities and adequate appropriations, practically all of the additional capacity now planned could be installed by July 1, 1944, thus advancing the present schedule one year.

Under the present schedule, the Bureau will have in operation capacities as follows:

By December 31, 1942,	1,620,462 kilowatts;
By December 31, 1943,	1,855,062 kilowatts;
By December 31, 1944,	2,686,562 kilowatts;
By December 31, 1945,	3,212,662 kilowatts.

Practically all of the present capacity and that scheduled is located 200 miles or farther inland from the Pacific Coast. The only exceptions are Shasta Dam, of 375,000 kilowatt capacity, scheduled for operation early in 1944, and Keswick Dam, of 75,000 kilowatt capacity, scheduled for 1943, both of the Central Valley project in northern California, and two relatively small developments in southern California. Both Boulder Dam in the Southwest and Grand Coulee Dam in the Northwest are located more than 200 miles from the Pacific Coast.

In addition to the conservation and economical utilization of western water power resources, the power developments make possible the processing of minerals which otherwise would remain untapped. The utilization of the magnesite beds of Washington and Nevada for the production of magnesium is a case in point. Aluminum reduction plants, airplane factories, shipyards, and electrochemical plants receive power from Bureau of Reclamation plants.

All of the larger projects of the Bureau of Reclamation have multiple purposes. Several provide vital water supplies for areas where extensive industrial and military activities are concentrated.

Among these is Boulder Dam, which stores water diverted later by Parker Dam for a larger part of the supply for the metropolitan area of Los Angeles, California.

In addition, about 20 percent of the irrigated land in the West is dependent upon Reclamation project works for primary or supplemental water supplies for crop production. The development of multiple-purpose projects, which include power and irrigation, contributes to the industrial and agricultural expansion of the West. These projects meet emergency needs in manufacturing and food requirements and pave the way for the West to maintain a larger self-sustaining peace-time population.

The General Land Office is taking an active part in the mobilization of natural resources for war-time needs both through the conduct of regular work and through additional duties of specialized military significance.

Withdrawals of land: The needs of national defense require the establishment of sites for military reservations, aviation fields, naval bases, bombing and gunnery ranges, sites for anti-aircraft guns, air navigation sites, radio stations, seaplane bases, demolition and practice bombing ranges, marine corps combat and training areas, et cetera. Since the beginning of the present emergency approximately 14,000,000 acres of public lands have been withdrawn for such purposes. Of these 9,200,000 acres were withdrawn during the past 18 months. In these withdrawal cases, status or title examination must be made to determine whether the lands desired are available for the purposes sought. If the lands are under the jurisdiction of any other bureau or department, correspondence must be had with such departments. If the lands are affected by outstanding claims of any kind, the facts must be ascertained and the conflicts removed, if possible. The Executive orders withdrawing the lands are prepared and promulgated by the General Land Office.

Contests: Many areas urgently needed by the Army and Navy for defense purposes have been found to be occupied by mining claims, many of which are invalid. This office has brought more than 7,600 contests within the past year against claims in two such areas alone. Investigations recently have been ordered on seven additional areas, and it is anticipated that it may be necessary to bring more than 20,000 contests within the next 18 months in order to clear the lands of the invalid mining claims so that they may be put to such use as may be required by the Army and the Navy. Many of the cases no doubt will go to trial.

Mineral Leasing: Under the mineral leasing laws (covering coal, oil and gas, oil shale, potash, sodium, phosphate, and sulphur), administered by the General Land Office, 4,429,948 acres of public lands are covered by outstanding leases.

Due to the emergency, restrictions against drilling oil wells on certain types of leases, amounting to 50 per cent or more of those outstanding, have been removed. This change approximately doubles the work on this type of leases.

The modification of the regulations relating to prospecting leases in order to encourage more prospecting and the discovery of additional oil reserves is under consideration.

Mining Claims: The present war has multiplied several fold the demand for minerals of which there was and is a deficiency, Many mining claims intended to supply the needed minerals are being located on the public lands. During the months of July, August and September, more mineral entries were made than were made during the entire fiscal year ended June 30, 1941.

O. and C. Timber: Timber sales from the Oregon and California revested and reconveyed grant lands in western Oregon have increased about 50 per cent, due largely to war demand. The use of this timber is releasing huge quantities of critical materials for direct defense uses, while also furnishing lumber for such war purposes as ships, airplanes, ordnance plants, Army housing, boxes for ammunition and food, and dozens of other uses.

Grazing Leases: The national war emergency has resulted in an increased demand for beef, hides, wool, and other livestock products and is responsible in a measure, no doubt, for the constantly increasing demand for new and renewal grazing leases by the General Land Office under the Taylor Grazing Act. The area embraced in the outstanding leases increased from 7,411,987 acres at the close of the fiscal year ended June 30, 1940, to 9,111,000 acres at the close of the fiscal year ended June 30, 1941. New applications for grazing leases are being received at the rate of 150 per month.

In this connection, owing to the present war-time emergency that affects the entire Nation, the work of the Grazing Service assumes an extremely important role in the production of cattle and sheep for food, wool, leather and other by-products on a full production basis,

at the same time seeing to it that the natural forage resources, so vital to the continued national welfare, are properly used and not depleted.

The Grazing Service does not at present contemplate any increase in production unless the forage reserves warrant it, but the lack of increase in the number of cattle is being made up by heavier weight cattle. The great increase in the number of cattle during the last war was one of the major factors in ruining the range.

Aviation Leases: The Act of August 16, 1941 (Public Law No. 205), amended Section 1 of the Act of Congress approved May 24, 1928 (45 Stat. 728), so as to increase the area which may be leased for use as public aviation fields from 640 acres to 2,560 acres. The purpose of the amendment was to provide facilities for the landing and taking off of present day aircraft. It is anticipated that there will be much activity during the next few years in connection with the statute mentioned. All such leases provide that the Secretary of War may assume full control of the airport whenever the President may deem such control necessary for military purposes.

Town Sites: To meet the demands for living facilities, a number of Government town sites have been established on the public lands in the vicinity of Army and Navy projects. Town sites of this kind have been surveyed or are under consideration at Passage Canal, Alaska, in connection with a Naval project; at Ford, California, in connection with a nearby Army air base; at Unalaska and Sitka, Alaska, to meet the requirements of Army and Navy projects; and at Argus, California, in connection with a potash and chemical plant engaged in production for war purposes.

Privileges Accorded for Military or Naval Service: The Soldiers' and Sailors' Civil Relief Act of 1940 (54 Stat. 885) extends certain relief and benefits in connection with the public lands to persons engaged in the military or naval service. Credit is given under the homestead laws for the period of the military service; public land claimants are accorded relief in the matter of payments, et cetera.

The Office of Indian Affairs, inasmuch as it has jurisdiction over the Indians of the United States and the natives of Alaska, is largely responsible for the contributions which the Indians and their resources may make toward the war effort.

Indian Service officials conducted the first registration under the Selective Service Act and will be responsible for the second

registration. The isolation of reservations often makes it difficult for the regular registration machinery to operate.

On September 30, 1941, 1,621 out of the 31,425 Indians and natives of Alaska, who had registered under the Selective Service Act, had been inducted and an additional 2,441 had volunteered in the Military and Naval Service.

Through the efforts of the Office of Indian Affairs, more than 2,000 Indians are now employed in war industries.

Defense training courses are being given in many of the Indian Schools and among the Indian CCC enrollees.

The Indian Office supervises the storage and delivery of water for the irrigation of 800,000 acres of land in 17 western states. Crops, mostly food, valued at between 25 and 30 million dollars, are harvested annually on these projects.

Indians, since last April, have invested $1,277,650 in bonds of the United States. This does not include individual purchases made locally. Through resolutions, several tribes have offered their resources, including funds, to the Government.

Indians who have funds in the Treasury of the United States have been asked to forego their requests for withdrawals and distribution of per capita payments and to leave them in the Treasury available to the Government for war use.

The Indian Office has made available many of its hospitals located on the West Coast for war use. A survey of existing hospital facilities, as well as other types of buildings which might be converted into hospitals, is in process. Medical staffs are completely mobilized for the war and are prepared at a moment's notice to give every effort needed.

The Indian Office possesses a large amount of heavy machinery, which is used for land subjugation, road construction, and the like. These facilities have been placed at the disposal of the Civilian Defense Authorities to be used to repair roads and bridges.

On the Yakima Reservation in Washington, there is a large concentration of aliens, especially Japanese. A complete census of such individuals residing on Indian lands is now under way.

135 fire-lookout towers are posts for the detection of enemy aircraft.

In Alaska and in many of the isolated areas of the United States, Indian Service communication facilities are especially important. These have been placed on a war-time basis and are available for immediate use.

Army officials have requested and have been supplied with detailed maps of Indian lands along the Mexican border.

An extensive campaign is being conducted among the Indians for the production of food supplies. A food-drying program is being initiated to replace foods which were formerly canned. Loans are being made to Indians to enable them to increase their production. Indian cattle herds, totaling 325,000 head, will be culled to make more beef available. The best breeding cows will be retained for reproduction. Studies are being made of the availability of irrigated and dry agricultural lands for the growing of special crops for war purposes. The Indians own 42 million acres of grazing land.

Indian forests are important. During the fiscal year 1941, 600 million feet of timber, valued at $1,835,000, were cut on Indian Reservations. A large portion of this timber was used in the war program. Over 30 million feet were manufactured at Indian sawmills.

In 1940 Indians caught over 16 percent of the 6½ million dollar salmon pack in Oregon and Washington, as well as a comparable portion of the 31 million dollar Alaska pack. Large quantities of fresh water food fish are shipped from several reservations. The Red Lake Fisheries supply between three-quarters of a million and a million pounds of fish annually to the markets of Minneapolis and Chicago.

The Indian Service has assumed a large responsibility toward hemisphere solidarity and defense, by the creation by executive order of the National Indian Institute. The Indians of the countries south of the Rio Grande number more than thirty millions. They are the dominant populations of Mexico, Guatemala, Peru, Bolivia, and Ecuador.

The National Indian Institute is classified as a war agency, and its activities are financed from war funds by the Coordinator of Inter-American Affairs. By Presidential Executive Order, it is

responsible for maintaining liaison between agencies of the United States Government, directly or indirectly concerned with Indian administration, or of Indian studies in this and other countries, for the purpose of coordinating activities of the United States and other nations in regard to Indian matters. It operates under a Policy Board, on which there are representatives of five federal agencies, and of two private agencies. Its activities are predominantly concerned with cooperation with the Inter-American Indian Institute in Mexico City and officials and Indianists in other American nations. It also coordinates relations between the United States and other American nations on Indian matters.

In conclusion, I wish to state to your Committee that the representatives of the Department are at your disposal at any time for consultation on this program or on any other matters with which the Department is concerned. I also wish to point out that the Department's program is necessarily dynamic. It must change with the needs of the Nation.

Sincerely yours,

Harold L. Ickes

Secretary of the Interior.

Hon. Joseph C. O'Mahoney,

United States Senate.

DEPARTMENT OF THE INTERIOR

INFORMATION SERVICE

OFFICE OF THE SECRETARY

For Release MONDAY, FEBRUARY 16, 1942.

A proposed expansion program of mineral and power developments in the United States scaled to meet the enormous demands of the President's war production schedule was laid before the Senate today by Secretary of the Interior Harold L. Ickes.

In response to an inquiry from Senator Joseph C. O'Mahoney of Wyoming, Chairman of the sub-committee which has been investigating the use of the resources of the West, Secretary Ickes submitted details of a program which would use low-grade domestic ores to help make the United States independent of foreign minerals during the emergency, save millions of tons of shipping and possibly the use of Navy vessels for convoy, and would also look toward the rounded development of the West. It included sample power projects out of many possible developments in the West. These 17 sample projects in 12 states would provide ten billion kilowatt hours of energy annually.

Secretary Ickes' reply to Senator O'Mahoney showed that the Department of the Interior was ready, upon Congressional authorization, to act immediately in harnessing to the war effort the vast mineral and power resources of the Nation. Basic information requested by Senator O'Mahoney, which is covered in the multi-point resources mobilization program reported by

Secretary Ickes, included the financing of mineral and industrial development, avoiding monopolization, and the development of additional power facilities to meet war requirements, and later to serve America in peace.

The program includes large-scale development of low-grade ores in order to make a "far greater use of the mineral resources of the Nation than has yet been made," a plan of action which the "Department of the Interior is and steadily has been for."

Major points of the program are:

MINERAL DEVELOPMENT PROGRAM

1. To solve "the problem of securing wide and general use of new processes" the Department asks Congress to instruct the Bureau of Mines to "push its work to a triple-speed basis" on the development of: "means for the processing of low-grade manganese ores, or alunites and magnesites;" plants to use new iron ore reduction processes producing sponge iron for later smelting, economical extraction of such metals as "copper, lead and zinc from our abundant resources of low-grade ores," and increased production of the "alkali and alkaline earth metals --- lithium, sodium, strontium, barium, and beryllium." To further the utilization of mineral resources by the power generated at Bonneville and Grand Coulee dams, Secretary Ickes proposed an "electro-development laboratory, to be situated in the Pacific Northwest."

As part of this general problem, "all enemy alien patents and processes" are to be examined and tested, while "all American-owned patents and processes for minerals needed for winning the war" should

be "made available for the confidential use of the Bureau of Mines" with a view toward "recommending the most effective processes." The Bureau of Mines will stand ready "to provide every user of processes developed by the Department, or recommended by it, with part of the time of a skilled engineer." Secretary Ickes also proposed that "records of all mineral development in the areas listed be made available confidentially to the Geological Survey and the Bureau of Mines in order that they may utilize the information to speed up the exploration work."

2. To break the "second major bottleneck" in "the production both of ores which had been considered strategic, such as tin, antimony, mercury, and nickel, and ores that had not previously been considered strategic, such as copper, zinc, lead, and iron," Secretary Ickes proposed that "Congress make funds available for exploratory work by the Bureau of Mines and the Geological Survey for copper, iron, chromite, zinc, and lead," involving the assignment of 250 additional engineers and geologists to intensive exploratory work in "low-grade areas" in a tentative list of 22 States and Alaska.

3. To break the "third major bottleneck" of securing capital for the development of short-lived or low-grade ore bodies and for mills or smelters to develop such low-grade materials," Secretary Ickes proposed that, when requested by the War Production Board, the "Department of the Interior should be given the power to certify to the Reconstruction Finance Corporation for loans to companies or individuals seeking to develop low-grade ores or contracting mills or smelters for the production of these essential war minerals," and that this certification be

construed as an "obligation on the Reconstruction Finance Corporation" by amendments to the Reconstruction Finance Corporation Acts. Finally, "if private capital or competent management is not interested in developments of considerable risk," the Bureau of Mines be allowed "to develop the mines or custom mills or refineries and to be given the same long-term contracts as are offered to private citizens."

Secretary Ickes said that he would forward later a "draft of mineral and power development legislation" in accordance with Senator O'Mahoney's request, "intended to break the financial bottleneck," and containing provisions establishing a "Minerals Policy Board of nine, including representatives of the Secretaries of War and Navy and the Chairman of the National Resources Planning Board," in addition to providing for "the initiation of regional marketing studies," and "a leasing system which will tend to prevent the non-use of needed mineral resources."

4. Recommendations for manganese development sufficient to produce approximtely 2,683,000 long tons of manganese metal, enough for 429,000,000 tons of steel, and providing for the establishment of 8 large milling plants, 3 hydro-metallurgical processing plants and 1 matte smelting plant; all of which would save 1,112,680 tons of shipping per year from Brazil and Cuba to the United States. Deposits in 13 districts of 8 states would furnish the necessary ore tonnage.

5. Recommendations for the revision of aluminum manufacturing practices to make the fullest possible use of new processes developed by the Bureau of Mines which utilize common domestic shales, natural alums, leucites, glaucanite sands, feldspars and aluminum-bearing tailings from porphyry copper deposits to produce alum in small plants. The alum can

be shipped to large centrally-located plants for conversion into alumina, the basic aluminum material, by the use of another process recently developed by the Bureau of Mines.

6. Three new processes for production of magnesium are reported in final stages of development by the Bureau of Mines, in addition to other processes which extract magnesium from widely-occurring rock formations instead of the usual sea water or relatively scarce deposits of magnetite. If put into wide use, "they will permit the production of magnesium by processes not privately controlled and will insure the continuation of the magnesium industry after the war period on a non-monopolistic basis."

7. Low-grade chromites, capable of producing 1,000,000 tons of metallurgical grade concentrates for chromium production, can be utilized when processes being developed by the Bureau of Mines are put into productive use. About 250,000 tons of this grade concentrates were required in 1941.

8. Recommendations for further exploration of carnotite deposits to "supply most of the victory needs" for vanadium for tool steels; and development of methods of vanadium recovery. Additional vanadium "can be obtained from the very large known reserves of titaniferous magnetite which occur particularly in California."

9. The report recommended that Congress utilize the analyses of the Interior Department-created Consulting Committee on Northwestern Phosphates when they are completed "as to superphosphate and phosphorus, or alternatively, vanadium; and that if warranted, Congress support the construction of such a plant as may be proposed for the war effort and for the service of the farmers in the West."

POWER DEVELOPMENT PROGRAM

10. In regard to the electric power needs for processing and fabricating minerals for the war program, and to give proper consideration "to the needs of the states in safer areas behind the mountains as well as to the needs of the coastal states," construction of 17 sample power projects offering 1,480,000 kilowatts of installed capacity, and a maximum total annual production of 10,190,800,000 kilowatt-hours was proposed. These additions alone would be enough to produce more than a billion pounds of aluminum or magnesium annually.

Both steam and hydro plants are listed at an estimated total cost of $350,603,000 and would "result in self-liquidating returns, within 40 years, at prices between 2.64 mills and 3.06 mills per kilowatt-hour" with normal costs. Normal costs of these power projects are based on construction estimates as of January, 1940, and total up to $271,713,000. Secretary Ickes proposed that the difference between the normal cost and the present cost, termed an "abnormal increase in construction cost," should "be paid off, but that the repayment be postponed until after the end of the customary 40-year period during which the normal cost of the projects would be liquidated."

Because a "major bottleneck in the manufacture of generating equipment is in the forging of shafts," the report pointed out that the proposed type of projects "may press less upon the bottleneck of forgings than many other projects which might be considered" since they will use smaller shafts more readily available. In addition "the power contributed by these projects carries a very high ratio of firm to secondary

power, and is therefore more valuable for the electro-metallurgical industries."

An 8-point yardstick for measuring priority of allocations for power construction included under Point No. 1: "Only the projects essential for the successful and rapid prosecution of the war should be constructed now."

The report stated that "all of the hydroelectric projects proposed, together with the steam auxiliary plants, would contribute to the irrigated agricultural output of the West necessary to meet war needs for food and fiber, and would aid in maintaining the stability of the West in the post-war period. Irrigation is the major one of the other purposes listed."

Also included, with a request to the Committee "to give consideration to the following statement," was a list of projects recommended by the Bonneville Power Administration because they "could go into action fast, and would require relatively small amounts of vital materials for the return in energy that they would give." These included requests for "high priorities on the six Coulee units,"..."high priorities on the shafting of the last four Bonneville units,"...and suggested action by the proper authorities for the "elevation of Ross Dam, on the Skagit River, belonging to the City of Seattle," and "acquisition of the Rock Island Dam of the Puget Sound Power and Light Company." As additional possibilities, Nisqually Dam and Umatilla Dam, both in Washington State, were mentioned.

The report quoted continued urging by Secretary Ickes that defense agencies give consideration to locating aluminum, magnesium, and other power consuming loads such as zinc on the public projects in the West so that the plants will be useful at the end of the war instead of tieing them up to the closing-down policies of companies with Eastern interests.

"The measures I have suggested above, under the heads of mineral development and power for the West," said Secretary Ickes, "would do something to put individuals and small companies into action for the war and for a few years afterward. While that would be something definite toward winning the war, it would not be any great underpinning for the post-war situation in the West."

"I believe," Secretary Ickes declared, "that the decisions and actions now being taken will increase the spread of large industry control of the resources of the West and of the Nation rather than the contrary."

The report also included a review and an outline of the part played by the Department of the Interior in encouraging greater war production. Although activities promoting 100 octane refinery construction and oil resources exploration were mentioned, Secretary Ickes said that "the Department's oil program will be announced separately."

Also cited in detail for their efforts in the war program were the Division of Power, the Bureau of Reclamation, the General Land Office, the Grazing Service and the Office of Indian Affairs.

BREAKDOWN BY STATES

Breakdown by states of the extensive program of mineral and power development proposed by Secretary Ickes, follows:

ALABAMA

Exploratory work on iron ore deposits.

ARIZONA

Exploratory work on copper deposits in the Verdi, Globe, Pioneer, Miami, Mineral Creek, Ajo, Silver Bell and Warren districts.

Construction of a milling plant to produce 240,000 long tons of manganese metal at Artillery Peak, also at Parker Dam for 30,000 tons.

Mining of 3,000,000 tons of manganese ore in the Artillery Peak district, and 100,000 tons in the Parker Dam District.

Power project at Bridge Canyon, Colorado River, Arizona, of an ultimate 600,000 kilowatts capacity. Present cost of construction, including lines and substations is $173,000,000.

ARKANSAS

Construction of a milling plant to produce 294,000 long tons of manganese metal at Batesville.

Mining of 1,500,000 tons of manganese ore in the Batesville district.

CALIFORNIA

Construction of a milling plant to produce 30,000 long tons of manganese metal at Parker Dam.

Mining of 100,000 tons of manganese ore in the Parker Dam district.

Exploration of titaniferous magnerites for vanadium production if greater supply is needed.

Exploratory work on copper deposits in the Engels and Spring Garden districts; on iron ore deposits, and also on chromite deposits.

Power project at Sacramento, a 50,000 kilowatt steam plant. Present cost $6,250,000.

Power project at Newark, a 150,000 kilowatt steam plant. Present cost is $18,750,000.

COLORADO

Exploratory work on copper deposits in the Bonanza district, on lead in the Leadville, San Juan and Rico districts; on zinc in the Leadville, Eureka and Rico districts, on carnotite (vanadium) deposits.

Power project, the Fort Collins Plant, Colorado-Big Thompson project. A steam plant of 100,000 kilowatts capacity. Present cost is $12,500,000.

IDAHO

Exploratory work on lead deposits in the Shoshone and Bonner districts; on zinc deposits in the Shoshone district.

Power project on Scriver Creek, Mountain Home, of 120,000 kilowatt capacity, multiple-purpose installation. Two plants of 30,000 and 90,000 kilowatt capacity each. Present cost is $21,000,000 including proposed transmission lines.

Power project at Palisades on Snake River, of 30,000 kilowatt capacity, multiple purpose. Present cost, after allocations of portion of construction cost to irrigation and flood control, is $11,900,000.

KANSAS

Exploratory work on lead deposits in the Tri-State District; and on zinc deposits in the Tri-State district.

MICHIGAN

Exploratory work on iron ore deposits.

MINNESOTA

Exploratory work on iron ore deposits.

Construction of a milling plant to produce 210,000 long tons of manganese metal, and a hydro-metallurgical plant to produce 335,000 long tons, both in the Cuyuna Range district.

Mining of 7,000,000 tons of manganese ore annually in the Cuyuna Range district.

MISSOURI

Exploratory work on lead deposits in the Tri-State district and southeast section of the state; on zinc deposits in the Tri-State district.

MONTANA

Exploratory work on lead deposits in the Summit Valley district, on zinc deposits in the Summit Valley district, and also on chromite deposits.

Construction of a custom mill to produce 90,000 long tons of manganese metal at Philipsburg.

Mining of 500,000 tons of manganese ore in the Philipsburg district.

Mining of low-grade deposits of chromite for production of chromium by new process developed by Bureau of Mines.

Power project at Canyon Ferry on the Missouri River, of 36,000 kilowatt capacity, multiple-purpose installation. Present cost is $15,000,000.

NEVADA

Exploratory work on copper deposits in the Battle Mountain, Yerington and Robinson districts; on zinc in the Pioche district.

Construction of a milling plant to produce 150,000 long tons of manganese metal, and a hydro-metallurgical plant to produce 291,000 tons, and an electrolytic manganese plant to produce 12,000 tons annually, all at Las Vegas.

Mining of 2,850,000 tons of manganese ore at Las Vegas, 5,000,000 tons at Pioche and 38,000 tons at Valmy.

Mining of dolomite deposits near Sloan for magnesium production.

Power project at Mystic, Truckee Storage project, multiple purpose, of 22,000 kilowatt capacity. Present cost is $6,650,000.

NEW JERSEY

Exploratory work on iron ore deposits.

NEW MEXICO

Exploratory work on copper deposits in the Central, Fierro, Burro Mountains and Lordsburg districts, on lead in the Willow Creek District, on zinc in the Willow Creek District, and also on iron ore deposits.

Construction of a milling plant to produce 17,500 long tons of manganese metal at Deming.

Mining of 150,000 tons of manganese ore in the Deming district.

Power project at Albuquerque, the Albuquerque Power Development, a steam plant of 25,000 kilowatts capacity, multiple-purpose. Present cost is $4,205,000.

NEW YORK

Exploratory work on iron ore deposits.

NORTH DAKOTA

Power project on Missouri River, near Bismarck. A multiple-purpose steam plant of 25,000 kilowatts capacity. Present cost is $4,125,000.

OKLAHOMA

Exploratory work on lead deposits in the Tri-State district, and on zinc in the Tri-State district.

OREGON

Exploratory work on zinc deposits in the Lane district, and on iron ore and chromite deposits.

Rapid completion of Bonneville-Coulee power system.

PENNSYLVANIA

Exploratory work on iron ore deposits.

SOUTH DAKOTA

Construction of a plant utilizing the matte smelting process to produce 315,000 long tons of manganese metal at Chamberlain district.

Mining of 50,000,000 tons of manganese ore in the Chamberlain district.

Power project at Mobridge, a multiple-purpose steam plant of 25,000 kilowatts capacity. Present cost is $4,125,000.

TENNESSEE

Exploratory work on copper ore deposits in the Ducktown district, on zinc in the Jefferson and Washington districts, and on iron ore deposits.

TEXAS

Power project at El Paso, the Rio Grande project. A steam plant, multiple-purpose of 25,000 kilowatts capacity. Present cost is $3,600,000.

UTAH

Exploratory work on lead deposits in the West Mountain, Rush Valley, Blue Ledge and Tintic districts, on zinc in the West Mountain and Blue Ledge districts, and on iron ore deposits, and carnotite (vanadium) deposits.

Construction of a custom mill to produce 80,000 long tons of manganese metal, at Delta, and a hydro-metallurgical plant to produce 630,000 long tons, at Garfield.

Mining of 740,000 tons of manganese ore in the Delta district, and 100,000 tons in the Tintic district.

Power project on the Colorado River at Dewey. A multiple-purpose project of 150,000 kilowatts capacity. Present cost is $50,000,000.

Power project at Lake Utah. A steam plant of 50,000 kilowatts capacity. Present cost is $6,650,000.

WASHINGTON

Exploratory work on copper ore deposits in the Chelan district, on lead in the Metaline Falls district, on zinc in the Metaline Falls district, and on iron ore and chromite.

High priorities on the manufacture of six Grand Coulee units to provide total additional firm energy production of 1,536,800,000 kilowatt hours.

High priorities on the shafting of the last four Bonneville units, which may gain as much as 500,000,000 kilowatt hours.

Construction of Umatilla Dam, now being considered by Congress, as included in the present Rivers and Harbors bill.

WYOMING

Exploratory work on chromite deposits, in addition to the trona explorations now being conducted.

Power project at Kortes. Kendrick project, a multiple-purpose plant of 30,000 kilowatt capacity on the North Platte River. Present cost is $8,310,000.

Power project at Heart Mountain on the Shoshone River. A multiple-purpose hydro-plant of 10,000 kilowatt capacity. Present cost is $1,060,000.

TERRITORY OF ALASKA

Exploratory work on chromite deposits.

NOTE: Complete text of the letter to Senator O'Mahoney is available upon request at the Department of the Interior, Room 7216, telephone Republic 1820, Extension 3171.

DEPARTMENT OF THE INTERIOR

INFORMATION SERVICE

OFFICE OF THE SECRETARY

For Release MONDAY, FEBRUARY 23, 1942

A seven-phase plan of activity to serve in mobilizing strategic natural resources of the Nation was announced as the war program of the Department of the Interior today by Secretary Harold L. Ickes.

Conversion of all bureaus and divisions of the Department to function as coordinated units of a Federal wartime agency is being completed. Activities which were considered desirable in peacetime, and which now are vital in war, have been accelerated. Other activities, essentially peacetime in character, have been subordinated to these war efforts.

The Department's program aims to make possible the supplying of the essential metals, oil, power, fuel, helium, food, land, water and timber for war. A total of 52 distinct proposals of recommended actions are listed.

"Adoption of these action programs, from Pearl Harbor to peace, will depend upon the contribution they will make to the winning of the war," Secretary Ickes said.

Secretary Ickes pointed out that the long experience of the Department in conserving the Nation's resources for the time of need will now ease the task of turning them to the supreme effort. At the same time, it will protect the resources themselves from foolish, shortsighted, or wasteful exploitation. The program was evolved by the War Resources Council of the Department in fulfillment of a departmental order written on Sunday, December 7, 1941, which declared that the Department's "immediate and primary function is the full mobilization of the Nation's natural resources for war."

The program follows:

P.N. 177919

THE WAR PROGRAM
of the
DEPARTMENT OF THE INTERIOR

It is the war program of the Department of the Interior to serve in mobilizing strategic natural resources of the Nation on the scale made necessary by global warfare.

The Department's program has as its aim the supplying of essential raw materials, ores, minerals, metals, fuels, and power to the industrial processors and fabricators in order to attain the National war production goals set by the President.

The Department and all of its agencies will devote the full knowledge and experience gained through years of development, conservation and study of these natural resources to the winning of the war.

Technical aid and information will be supplied promptly by the Department to the War Production Board and industries or agencies processing raw material for war.

Proper authority or financing will be requested as needed.

METALS FOR WAR

Machines have made this war unique, and have raised metals to first rank among essential war materials. Only an increasing production of ores can keep the factories running, labor busy, and the Army and the Navy supplied with fighting planes, weapons and ships. Years of exploration and experiment have prepared the Geological Survey and the Bureau of Mines to move the country forward toward production on a victory scale by turning known but unused, low-grade materials into metals now more vital than gold.

The Department proposes:

1. To secure the immediate use of new processes discovered or tested in its own laboratories which can supply enough manganese to make 87 million tons of steel annually from low-grade domestic manganese ores and save millions of tons of shipping and convoys; to aid in opening up 50 ore bodies; to aid in establishing 12 plants in Arizona, Arkansas, New Mexico, Minnesota, Montana, Nevada, South Dakota and Utah and later in other States as warranted. In the event industry is unable to produce the needed manganese, the Department stands ready to design, construct and operate the plants (Bureau of Mines).

2. To give all aid possible, after the approval of the War Production Board, toward the establishment of plants using the Department's improved acid process for producing aluminum; to help small enterprises to utilize scattered minor deposits of alunites, lucites, shales, sands and clays in making alum for this purpose by supplying them with instructions on roasting these materials. To aid in the establishment of plants for using the process and to aid plants using the new process to speed up their production. To make available its recommendations, testing experience, and engineering personnel for the use of the new magnesium processes utilizing domestic ores. To complete and secure the prompt use of a process for producing half a million tons of chromium concentrates annually from low-grade chromium ores. In the event that industry is unable to produce the needed quantities of these three critical materials, the Department stands ready to undertake the design, construction and operation of the necessary plants. (Bureau of Mines).

3. To explore for copper in California, Nevada, Utah, Arizona, Colorado, New Mexico, Tennessee, and Michigan; to begin explorations for zinc in Missouri, Kansas, Idaho, Utah, Nevada, Montana, Colorado, New Mexico, Wisconsin, Tennessee, Oregon and Washington; to explore for lead in Colorado, Idaho, Kansas, Missouri, Montana, New Mexico, Oklahoma, Utah and Washington; to explore for iron in Alabama, California, Minnesota, Michigan, New Jersey, New Mexico, New York, Oregon, Pennsylvania, Tennessee, Utah, Washington, Wisconsin and Wyoming; and to speed explorations for chromite in Alaska, California, Montana, Oregon, and Washington. To speed exploration for additional bauxite, alunite and aluminous clays. To make the records of all of the explorations available promptly to all interested. (Geological Survey, Bureau of Mines).To supervise operations on zinc and lead properties on Indian lands which represent over one-tenth of the Nation's supply. (Office of Indian Affairs, Geological Survey).

4. To speed exploration for vanadium, tungsten and mercury sources; to investigate with increased speed methods of processing the ores more efficiently and rapidly, and to propose properly located custom mills. To increase the output of iron by utilizing a process for making sponge iron

through gaseous reduction of ores, and through subsequent smelting in electric furnaces, giving particular attention to Western iron ores. To develop processes for conversion of low-grade copper, nickel, lead and zinc ores, also of boron, lithium, sodium, barium, beryllium. To speed the exploration of essential non-metallic minerals such as mica, graphite, asbestos, steatitic talc. Through the Consulting Committee on Northwestern Phosphates, to help make available vanadium or phosphorus for war and large amounts of low-cost fertilizers for the Western farmers. (Bureau of Mines, Geological Survey).

5. That all drilling and mining records of persons mining all the critical minerals be made available on a confidential basis to the Bureau of Mines, so that its exploration for additional sources can be speeded and conducted economically; and that colleges, universities, and state departments of mining and conservation can be enlisted to make available the services of the engineering faculties for exploratory work. (Bureau of Mines, Geological Survey).

6. To expand examination of patents and processes covering minerals needed for the war which are held by enemy aliens and to test and recommend the best for use; to recommend that all patents and processes of private companies covering the processing of raw materials needed for the war as well as the records be submitted confidentially to the Bureau of Mines to enable it to recommend plants for wider use of the best available processes; and to provide every user of processes developed by the Department or recommended by it, if required, with the advice and services of Bureau of Mines engineers to help in rapid and economical development. (Bureau of Mines).

7. To begin a national round-up of new metal resources by encouraging scientists and educational institutions to place in the hands of cattlemen, prospectors, science teachers, and others in likely areas, charts describing minerals needed for war, together with ore samples, where possible, and instructions on reporting new findings. (Division of Information, Geological Survey, Bureau of Mines, Indian Office).

8. To furnish the War Production Board as needed with a ranking of the best possible new developments of all critical ores, basing the ranking upon the latest ore-dressing tests, the latest explorations, and upon the expected quantity, speed and cost of production. To formulate for the War Production Board a domestic ore-buying program, and to stand ready to supervise it if requested. (Geological Survey, Bureau of Mines).

9. To protect mining and all forms of industrial production by the control of the handling of explosives through licensing persons permitted to manufacture, distribute, purchase, possess and use explosives, and through supervising the care and storage of explosives. (Bureau of Mines).

OIL FOR WAR

Without petroleum products, the war machine which the United States and the United Nations are now perfecting could not function. National petroleum production must be increased by the most efficient methods to fill mounting requirements. The production and operation of mechanized armies, self-propelled artillery, substratosphere bombers, and multiple-ocean navies require unfailing supplies of high-quality gasoline and lubricants and other oil products. The expanding industrial second line of defense and the third front at home also must be supplied. To meet the requirements, United States production may have to be raised to 1,500,000,000 barrels of oil a year.

Preparations to meet the challenge were made through the Office of the Petroleum Coordinator, which was established seven months before Japan made the Pacific a misnomer for the western ocean.

The Department proposes:

1. To organize petroleum production based upon sound engineering techniques so that operating wells and fields can produce at sustained rates without injury to our remaining reserves and so that the crude oils, condensates from high-pressure fields, and natural gasolines needed for aviation gasoline and lubricants, toluene, synthetic rubber, and other specialized products will be available in the quantities required when needed; to stimulate exploration for new reserves, and, through cooperation with State regulatory bodies, to leave in safe underground storage those crude oils not immediately important to the war effort. (Office of the Petroleum Coordinator)

2. To multiply the industry's capacity to manufacture high-octane gasoline for war planes to as much as 200,000 barrels per day; to stimulate the financing and erection of 100-octane plants; to control closely the aviation gasoline supply to insure its appropriate use; to organize the natural gas and natural gasoline industries to meet plant fuel requirements and to obtain the maximum production of the components of aviation gasoline, as well as rubber and other synthetic products, and to stimulate the production of aviation lubricants. (Office of the Petroleum Coordinator)

3. To establish new and more effective transportation methods required in moving blending stocks for aviation gasoline; to reshape the complex transportation system of the oil industry by substituting tank cars, trucks, barges, and pipelines for tankers diverted to war service. (Office of the Petroleum Coordinator)

4. To formulate and, if needed, to direct marketing programs to insure the best distribution of available supplies for civilian uses in the event of the disruption of normal deliveries; to coordinate marketing and distributing facilities so as to maintain inventories, and to find and obtain petroleum products for use by the armed forces, essential industries, and civilian activities if normal channels of procurement do not bring about the necessary results. (Office of the Petroleum Coordinator)

5. To formulate plans for the manufacture of essential components of synthetic rubber from petroleum products, including butadiene and styrene; and to stimulate expansion of plant capacity for the manufacture from petroleum of toluene for explosives. (Office of the Petroleum Coordinator)

6. To engage in an active geological exploration campaign with the view of determining all possible areas in which prospective drilling for new deposits of petroleum and natural gas may be successful. To promote and encourage exploratory operations on lands owned or controlled by the United States having potential value for petroleum products; to take steps to insure adequate and proper development of known reserves on such lands, and to cooperate with industry and State authorities in attaining these objectives where such lands are interspersed with lands not under exclusive Federal control. (Geological Survey)

7. To make available to the petroleum industry the latest developments in technical methods, practices and procedures in the production, handling, transportation and storage of petroleum and its products; to make available fullest technical guidance in the protection of petroleum in storage against deterioration, contamination, fire, or sabotage and other hazards; to keep the industry fully advised as to the trends of demands and requirements in order that it can gauge its necessary operations in advance so that the supply of products may be continuously available where, when and as needed. To conduct all of these activities in such a manner as to bring all units of the petroleum industry, large and small, into the war program; and to execute that program so that no unnecessary dislocation of competitive positions in the industry, or hardship to the general public, shall occur. (Office of the Petroleum Coordinator, Geological Survey, Bureau of Mines, Petroleum Conservation Division)

POWER FOR WAR

The war budget of 56 billion dollars will require 154 billion kilowatt-hours of electric energy annually for the manufacture of airplanes, tanks, guns, warships, and fighting material, and to equip and serve the men of the Army, Navy, and Marine Corps.

The requirement for power to meet the President's war program exceeds the total production of energy for all electric utilities in the United States in 1940. Solely to provide the aluminum for the President's goal of 60,000 new planes this year will require 8½ billion kilowatt-hours.

Germany, Japan, Italy and the nations which the Axis has subjugated had in 1940 more than half again as much electric energy as was produced for all of the power systems which supplied the peacetime requirements of the United States. This must be overcome by the conservation, diversion and expansion of Power.

The Department is the major producer of power in areas where the principal undeveloped resources are located. The Department produced in 1941 more than 5 billion kilowatt-hours, and by this was able to increase by one-fourth the Nation's aluminum production. Units recently completed at Boulder, Bonneville and Grand Coulee Dams now make the Department ready to produce at the rate of more than 7 billion kilowatt-hours annually.

<u>The Department proposes</u>:

1. To triple its 1941 output through the following program of installation which is now under way:

Time	Cumulative Total Kilowatts of Capacity	Kilowatt-Hours Produced Annually
December 7, 1942	2,010,987	10,785,000,000
December 7, 1943	2,461,587	13,322,000,000
December 7, 1944	3,293,087	18,501,000,000
December 7, 1945	3,819,187	21,712,000,000

(Bureau of Reclamation, Bonneville Power Administration)

2. To add by 1945, about 1,480,000 kilowatts, with an output of 9 to 10 billion kilowatt-hours, to the power capacity now scheduled, by constructing new hydroelectric and steam plants. (Bureau of Reclamation)

3. To advance a program by which 7,500,000 additional kilowatts with an annual output of 35½ billion kilowatt-hours can be made available within five years in the western States; to recommend construction of component parts of this program as needed; and to anticipate demands in order that construction plans may be in hand when needed. (Division of Power, Bureau of Reclamation, Bonneville Power Administration, Office of Indian Affairs, Geological Survey)

4. To allocate the use of its power among war industries in order to obtain the efficient development of local mineral resources and the greatest possible stabilization of local economies in the post-war period consistent with the fundamental purpose of prosecuting the war. (Division of Power, Bonneville Power Administration, Bureau of Reclamation)

5. To gather and disseminate data and information on stream flow fundamental to the operation and expansion of electric plants; and to supply information on water-power sites to those proposing to make developments. (Geological Survey)

FUEL FOR WAR

Coal provides half the Nation's energy and the rest comes from oil and gas and by water power. Coal is the prime mover of industry, and the basic source of heat and motive power for manufacturing, transportation, public utilities and the home. Coke fires the blast furnaces in the steel mills. The principal supply of many basic chemicals necessary for making

munitions, paints, medicines, artificial silk, plastics, etc., is obtained as byproducts of the manufacture of coke from coal.

The Office of the Coordinator for Solid Fuels estimates that more than 600,000,000 tons of anthracite, bituminous and lignitic coals, will be required in 1942. It is estimated that 70,000,000 tons of coke, will be required in 1942. The facilities of the Department have been mobilized to see to it that an adequate supply of coals and coke is available where and when it is needed.

The Department proposes:

1. To organize the production of coal so that sufficient quantities of necessary types and grades are available for war industries; to see that the supply of other coals is sufficient; to increase the production of coking coal by 10,000,000 tons, if necessary, in order to provide coke for the expanding steel manufacturing program; and to stimulate the expansion of coke manufacturing facilities where and when needed to meet the requirements of war. (Office of Solid Fuels Coordination, Bituminous Coal Division, Bureau of Mines)

2. To promote orderly production and distribution of coal; to promote the leveling of fluctuations in production and transportation so that plant and carrying facilities can be utilized fully; to encourage stable marketing conditions; to urge the maintenance of large reserves in consumers' storage to encourage the conservation of high grade coals for metallurgical or other specific uses; to maintain close vigil over production, preparation, marketing, transportation, storage and use of coal for the early detection of situations which might adversely affect the fuel supply; and to recommend the action necessary to correct any such situations as may arise. (Bituminous Coal Division, Bureau of Mines, Office of Solid Fuels Coordination, Geological Survey)

3. To aid users of special kinds or grades of coal, who may be deprived of their usual supplies in the event of shortages, in obtaining, if possible, substitute coals and in adapting these substitutes to specialized needs. (Bituminous Coal Division, Bureau of Mines)

4. To promulgate or revise minimum and maximum prices for producers of bituminous coal, as required in the public interest. (Bituminous Coal Division)

5. To administer the market regulatory features of the Coal Act in order to keep the bituminous coal mining industry in a sound

operating condition and to keep markets stabilized and thereby promote the stable mine production schedules which are necessary to attain full use of mine capacity. (Bituminous Coal Division)

6. To conduct a rigid mine safety inspection program for elimination of hazards, to conserve manpower, to protect mining machinery and property and to prevent interruption of mining operations. (Bureau of Mines, Geological Survey)

7. To establish technical information centers to assist coal and coke producers in maintaining maximum efficiency, and to give scientific aid to consumers in meeting coal utilization problems and to increase war production by improved mining metnods and improving the percentage of coal recovered in mining. (Bureau of Mines)

8. To test certain coals to determine their value for use in the manufacture of munitions, steel and other products, and their adaptability either for blending with other coals to meet quality requirements or as outright substitutes for other coals for specialized uses. (Bureau of Mines)

9. To determine the best American coals from which to produce motor fuels and to provide processes for making such motor fuel in case the natural petroleum supply fails to meet future demands. (Bureau of Mines)

10. To map coal reserves with information on the presence, thickness, depth, quality, and structural conditions affecting the minability of coal in all areas and to administer the coal leasing laws on public and Indian lands under war conditions. (Geological Survey)

HELIUM FOR WAR

Helium is a light, noninflammable war gas of which the United States Government has a world monopoly. To supply the increased demand for helium that has arisen from the war the Department is drilling 4 additional wells in the Government-owned fields which supply the Government helium plant; it is increasing the capacity of that plant 50 percent by installing an additional production unit, and it is preparing to construct an additional plant. Effective measures which in the past have prevented any of this helium from reaching the enemy will be continued.

The Department proposes:

1. To double in 1942 the record production of the 1941 fiscal year. (Bureau of Mines)

2. To make a comprehensive survey of gas fields suitable for helium production, in order to select sites for additional helium plants. (Bureau of Mines, Geological Survey)

3. To continue research to reduce costs of production of helium. (Bureau of Mines)

FOOD FOR WAR

Adequate food is essential to success at arms. In many ways the Department contributes to the food supplies of the United Nations. It will increase these contributions. For example, the 1,921 million pounds of fishery products utilized in 1939 can be increased in a few years, without injury to the resources, to 3,582 million pounds through proper management and development.

The Department proposes:

1. To increase as required within the next few years by 1½ billion pounds, our fishing products, principally fish foods for packing, including salmon and sardines, for the armed forces and civilian populations of the United Nations. (Fish and Wildlife Service, Office of Indian Affairs)

2. To store and deliver water for the irrigation of 10,000,000 acres of land in the arid west for the production of food crops, long staple cotton and other fibers, and rubber-bearing plants. (Bureau of Reclamation, Office of Indian Affairs)

3. To assure more adequate forage on Federal ranges for the 12,000,000 head of livestock grazing there in order to increase up to 10 percent the meat, fats, wool, mohair, leather, and other products of critical importance now produced on the 263 million acres of range land; to increase the program for seeding the public lands from 200,000 to 1,000,000 acres a year. (Office of Land Utilization, Grazing Service, Office of Indian Affairs, General Land Office, Bureau of Reclamation, Fish and Wildlife Service)

4. To increase the production of cane and beets to help meet the shortage in sugar for war purposes and domestic uses. (Bureau of Reclamation, Office of Indian Affairs, Division of Territories and Island Possessions)

5. To explore, particularly in the Caribbean and the Gulf of Mexico, new sources of aquatic products for use as foods, vitamin oils, and animal feeds; to survey present sources and seek new sources of Vitamin A to supply the domestic demand and the 10½ trillion unit requirements of Lend-Lease; to demonstrate methods of feeding oysters in order to increase by 100,000,000 pounds or 14 percent the food yield; and to develop methods of dehydrating fish.

6. To augment predatory animal and rodent control work, including plague bearing rodent control efforts in order to safeguard the Nation's food supplies and health. (Fish and Wildlife Service, General Land Office)

7. To conduct a food-drying program to relieve demands on tin and containers. (Office of Indian Affairs)

8. To assure, in so far as war conditions permit, an adequate food supply for the civilian inhabitants of the territories and island possessions. (Territories and Island Possessions, Fish and Wildlife Service, Office of Indian Affairs)

LAND, WATER, TIMBER FOR WAR

The increased production of those war necessities which are products of the forest, of the land and of the water is receiving careful attention from the Department which supervises and manages the Federal land estate of 283 million acres.

The Department proposes:

1. To increase to a billion board feet in 1942 and to a billion and a quarter in 1943, if required, timber production from the Oregon and California Revested lands and from Indian reservations; and to accelerate surveys for scarce species of wood such as Sitka spruce, rock elm, Port Orford cedar and oak in order to make them available for the armed forces. (General Land Office, Office of Indian Affairs, Office of Land Utilization, Grazing Service)

2. To establish fire lookout and air raid warning towers in forested areas and on grazing land; and to provide trained crews to combat forest fires and to man lookout and patrol stations for detecting and reporting fires and aircraft. (Office of Land Utilization, General Land Office, Office of Indian Affairs, National Park Service, Grazing Service)

3. To assure water supplies for municipalities and military concentrations through such projects as Boulder and Parker Dams in the Southwest, and the Provo River near Salt Lake City and Rapid Valley near Rapid City, South Dakota; and to propose additional programs for cities such as San Diego where normal water supplies are taxed beyond their capabilities by wartime increases. (Bureau of Reclamation, Geological Survey)

4. To advance the proposed International Highway to Alaska and other roads in that territory. (Division of Territories and Island Possessions)

5. To determine, in cooperation with other agencies, how some of the public lands in the southwestern United States and in the territories and possessions may be used for production of rubber-bearing plants. (Office of Land Utilization, General Land Office, Office of Indian Affairs, Division of Territories and Island Possessions)

6. To map areas of military significance; and to prepare, produce, and supply topographic maps required by the armed forces, and in industrial expansion. (Geological Survey)

7. To provide certain hospital and other emergency facilities together with medical staffs along the West Coast and in Alaska for use in case of need. (Office of Indian Affairs, National Park Service)

8. To increase the fur and wool supplies for clothing for the armed forces as well as for other needs. (Fish and Wildlife Service, Grazing Service, Office of Indian Affairs, General Land Office)

9. To withdraw public lands and to clear them of mineral and other claims so as to permit the establishment of military ranges, cantonments and aviation fields, as well as townsites. (General Land Office, Grazing Service, Fish and Wildlife Service)

10. To provide special facilities for rehabilitation and recreation of members of the armed forces in need of healthful surroundings, (National Park Service)

The war program of the Department gives to every scientist, specialist, technician, planner, and worker on its staff an opportunity to contribute actively to the Nation's need now. The Department will make the necessary adjustment of its procedure to obtain speed of action.

The long experience of the Department in conserving these very resources for the time of need will now ease the task of turning them to the supreme effort. At the same time it will protect the resources themselves from foolish, shortsighted, or wasteful exploitation.

The Department's program is not fixed or static. It will change, and the emphasis will shift with the changing fortunes of war.

In all fields, plans will be based upon the consideration of immediate needs and post-war problems. But adoption of action programs, from Pearl Harbor to peace, will depend upon the contribution that they will make to the winning of the war.