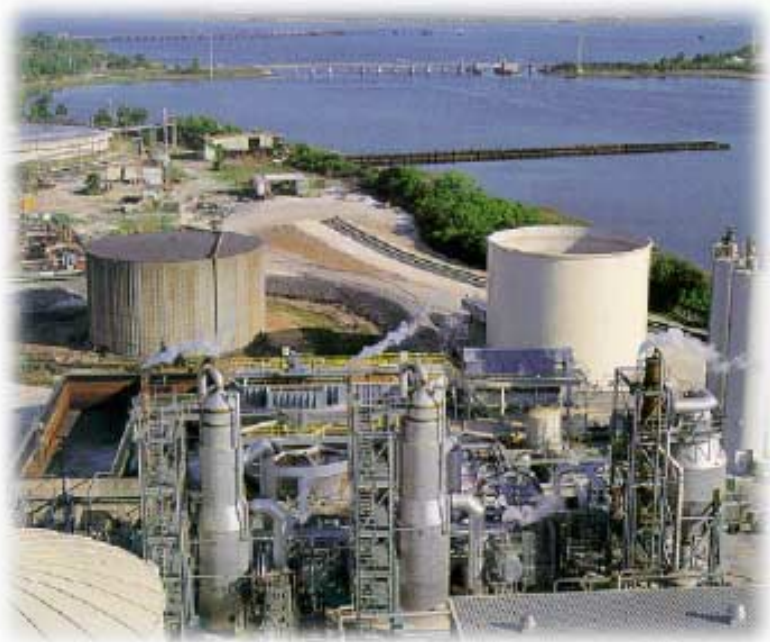


**Capabilities
Experience**

Water Wastewater Environment Power Process Project Diligence Economics

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CORBIN
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Photographs courtesy of RCC Corporation

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Horace R. Corbin, P.E.

*"Give Us Your Tough Issues And
Your Biggest Goals.
We'll Get Right To The Heart Of It."*

Projects

Horace and associates assist clients on major projects throughout the United States and in many foreign countries.

Mr. Corbin, chemical engineer, has 33 years experience in chemical, refinery, pharmaceutical, electric power generation (nuclear and fossil), mining, pulp and paper, electronics, food processing, water, and wastewater engineering.

Horace has several innovations to his credit involving germanium, technetium, tire manufacturing, acid production, nuclear power, reverse osmosis, high strength organic waste, power plants, environmental permitting, process design, Zero Liquid Discharge and systems control.

Horace has published many articles including those for the American Chemical Society, TAPPI, Power Magazine and Chemical Processing Magazine.

"The Driest Part of The Planet"



**Copper Mining On Top of The World...
The Andes Mountains, Zaldivar, Chile.**

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"We employ modern tools, talented people, innovation and dedication to enhance our services for our clients. We are devoted to maintaining leadership in these areas."



Driest Part of the Planet

Copper Mining at 13,000 feet... Without a drop of rain in 40 years, the Atacama high desert plateau in the Andes mountains in northern Chile is considered the driest part of the planet. It has the appearance similar to the surface of the moon. This area is the reserve of the major source of the world's copper ore. As luck would have it, modern techniques for copper electrowinning require high volumes of ultra pure water. WCA, Inc., as part of the team with several other organizations (Placer Dome, Fluor Daniel, BHP, Minera Escondida and others) are solving these mining production challenges. First, locate saline water in a volcanic aquifer, then pump it 60 kilometers horizontally and a mile straight up to the mountain (a considerable feat). Once at the mine, desalinate it to ultra pure water. The water system must also provide for the potable and sanitary needs of the miners. Add "fast track" scheduling to multi-lingual design, construction and operation. Link the engineering teams from many locations throughout the world over the Internet. Computerize the operation to achieve the necessary efficiency and reliability. Convert your ocean going cargo containers to living quarters at 13,000 feet elevation. That's what it's like at the driest part of the planet!



Technology Consulting Worldwide Chemical Process, Water, Waste, Production, Environmental, Research, Development, Consulting, Plant Design, Supply, Automation, Control, Instrumentation, Data Communication, Project Management



Technetium Exists Only in the Stars....

Created by stellar nuclear reactions, it doesn't exist naturally on this earth. Yet, uswca.com technology and equipment are helping to eliminate this nasty pollutant from a U.S. Department of Energy facility.

Since the end of the Cold War, disarming Soviet Union nuclear weapons is creating radioactive Technetium

wastewater - uswca processes and decontaminates the wastewater. Ultimately, the radioactivity is isolated (for a few thousand years) in solid concrete. The Technetium contaminant is separated from the wastewater and converted into a solid form by using special absorbing and reactive metal media.

Elemental Technetium, discovered in 1937, has about 19 radioactive isotopes with atomic masses ranging from 90 to 108. Some isotopes decay rapidly. The isotope ^{95m}Tc has a half life of 61 days. This rapidly decaying isotope is used as a tracer in the medical diagnosis of certain human ailments. Other isotopes have a half life measured in thousand of years. The isotope ^{97}Tc has a half life of 2.6 million years. This is troublesome.

Technetium was the first element to be produced artificially. Searches for the element in terrestrial materials has been without success. However, Technetium has been found in the spectrum of S-, M-, and N-type stars.

Corbin Consulting has assisted with many projects. Each one has an interesting technical, commercial and/or manufacturing story.

Aerobic & Anaerobic Biological Wastewater Treatment

Many wastewaters are purified of soluble organic contamination by utilizing the metabolic functions of microorganisms.

Special machines maintain precise conditions so that specific cultures thrive. These cultures feed on the wastes and purify the water. Two basic processes are employed.

The Aerobic process grows microbes requiring the presence of dissolved air (oxygen) in the water. This is normally accomplished with open chambers and air blowers. The Anaerobic process grows microbes that cannot exist with dissolved air in the water. So, the reactors are closed to the atmosphere. The plants can be large or small.



Treatment Plants are custom designed for each specific application. The nature and quantity of the wastewater are the largest factors influencing design configuration. A small size system is shown on the right.



Clarification

Treatment plants are composed of multiple unit operations, arranged in a coordinated manner to ensure performance and to minimize costs. A complete instrumentation and control system is required in modern day facilities.



Digestion

With attention to design detail and with proper training of personnel, the facilities can be easy to operate and to maintain.



Aeration

To protect the environment and to achieve regulatory compliance for wastewater discharge, many tools and considerable experience are available.

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REACTORS



- Water and wastewater are treated by chemical and physical means in reactor clarifiers as part of modern industrial and municipal facilities.

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PUTTING CHEMISTRY TO WORK



- Impurities in raw water are precipitated with chemicals in the reactor. Then, pure water is separated from the billowing mass.

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QUALITY SHOWS



- If there's art in engineering, quality most certainly is an essential component.

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PUTTING IT ALL TOGETHER



- It takes experience and commitment to get the complete job done. A little knowledge of chemistry and physics doesn't hurt either.

WCA Engineers - www.uswca.com

UP, UP AND AWAY



- Copper mines in northern Chile are high in the Andes Mountains, hundreds of miles from...well.

WCA Engineers

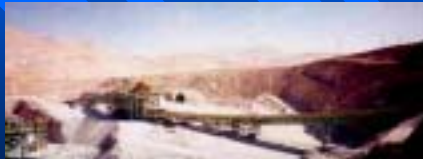
LUNAR LIKE



- Not a drop of rain in 40 years, the Atacama high desert plateau is considered the driest part of the planet.

WCA Engineers

HUNGRY, VERY HUNGRY



- Tons of ore are moved in seconds over distances of miles.

WCA Engineers

PROCESSING COPPER



- Copper is dissolved from crude ore then converted to pure solid plate in electrowinning facilities.

WCA Engineers

MILES AND MILES



- Processing facilities cover huge areas at the Chilean copper mines.

WCA Engineers

REACTORS



- Water and wastewater are treated by chemical and physical means in reactor clarifiers as part of modern industrial and municipal facilities.

WCA Engineers

STACKS AND STACKS



- Reverse Osmosis membrane stacks remove the salt from high pressurize water.

WCA Engineers

TOUGH GUYS



- Copper mining in the Andes is not for the timid or frail. Highly skilled men from around the world master the challenge.

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Simons
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Professional Profile

Horace R. Corbin, P.E.

President



Horace Corbin is owner of Corbin Consulting and of Watchung Communications, Inc. Company profiles are available at www.uswca.com and at www.goleader.com. Mr. Corbin has 34 years of business, engineering, and publishing experience. He has directed and served on many engineering projects involving nuclear energy, electric power generation, mining, refining, pharmaceutical, chemical, potable water, sewage, industrial waste, air pollution control, solid waste, "SuperFund" cleanup, pulp & paper, fiber optics and food & beverage processing throughout North America, South America, Europe, the Middle East and the Far East. Mr. Corbin is a registered professional engineer and a newspaper publisher in New Jersey. He has practiced professional engineering in several states including New York, New Jersey, Pennsylvania, California, Florida and Texas.

EDUCATION: Mr. Corbin is a chemical engineering graduate from Drexel University and elastomer technology from the University of Akron. He has many business, management and technical continuing education courses to his credit. He has authored several articles for publications including Power Magazine, Chemical Processing, American Power Conference, TAPPI and the American Chemical Society. He has lectured at many business and trade associations.

WORK HISTORY: Mr. Corbin was employed by Mobil Oil, Dupont, Exxon Research and Engineering, Graver Water Co., R. F. Weston Consulting Engineers and Degremont. He served in several capacities including research, development, design, management, sales and marketing. For the past dozen years, he owns and operates engineering consulting, newspaper and Internet publishing companies.

ENGINEERING PROFICIENCY: Mr. Corbin provides consulting for project development, economic review, Due Diligence, Expert Witness, concept & process design, instrumentation, control, communication networks, information management, training, documentation and troubleshooting for industry, government, authorities, financiers, architects, engineers, constructors and developers.

SYNOPSIS OF PAST WORK:

In the 1970's, Mr. Corbin commissioned several nuclear power plant facilities in the U.S. and Sweden involving radwaste treatment, reactor cleanup, fuel pool cleanup and condensate polishing. He commissioned advanced phosphorus removal for the EPA and designed water reuse techniques for pulp and paper. He led technology transfer from Germany for electromagnetic filtration of nuclear reactor core water, applied the use of reverse osmosis for high pressure boilers and developed new techniques for tire, inner tube and chemical production.

In the 1980's on New York City's sewage treatment plant upgrades, Mr. Corbin served in retrofitting the headworks, inlet bar screens and digester screens, which comprise some of the world's largest sewage treatment facilities. Also during this era, Mr. Corbin teamed with Exxon Engineering in developing air pollution oxidation treatment and catalyst fines removal processes which are now the standard for the world's refinery operation.

In the 1980's and 1990's, Mr. Corbin developed and implemented Zero Liquid Discharge technology for several dozen power stations and trash incinerators in the northeast, Florida, southwestern U.S. and California. In the 1990's, Mr. Corbin created advanced water systems for the world's largest copper mines located in Escondida and Zaldivar, Chile.

Mr. Corbin served on teams for many other varied projects including large potable water and sewage systems, village water and sewage systems, hospital wastes, toxic wastes, advanced tertiary systems, sterilization, anaerobic and aerobic food & pharmaceutical wastewater treatment, SuperFund cleanup, potable water systems with ozone, power plant cooling, germanium recovery for fiber optics manufacturing, oil/water separation in refining and steel making, technetium removal in weapons disarmament and luxury hotel utility systems. Mr. Corbin pioneered the use of computers, instruments, controls and networks to manage and optimize complex facilities and to coordinate regional operations.