# BEFORE THE
# WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

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## WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

### COMPLAINANT

### VS.

### US ECOLOGY, INC.

### RESPONDENT

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001288 ·

TESTIMONY

## DIRECT TESTIMONY OF CHARLES E. OLSON

1   Q.   Please state your name and business address.

2   A.   My name is Charles E. Olson, and my business address is

3        1828 L Street, N.W., Washington, D.C. 20036.

4   Q.   What is your occupation?

5   A.   I am an economist and President of H. Zinder &

6        Associates.

7   Q.   Please outline your education and experience.

8   A.   I attended and received the following degrees from the

9        University of Wisconsin at Madison:  B.B.A. in 1964

10       (Senior Honors), M.S. in 1966, and Ph.D. in 1968.  My

11       doctoral dissertation analyzed the structure of the

12       electric power industry.

13       I joined the University of Maryland in 1968 as an

14       Assistant Professor and taught full-time in the College

15       of Business and Management.  I taught graduate courses

16       in managerial economics, public utilities, and transpor-

17       tation and undergraduate courses in public utilities and

18       transportation.

19       In 1971, I was appointed Associate Professor, and

20       I held that position until leaving in September 1976 to

21       join H. Zinder & Associates as Senior Economist.  In

22       December 1977, I was elected Vice President, and, in

23       December 1979, I was elected Senior Vice President.  In

24       September 1980, I resigned to organize my own firm.  I

- 1 -

returned to H. Zinder & Associates in December 1986 as its President.

I have authored and co-authored various papers, articles, reports and other published material. These have been published in the Public Utilities Fortnightly, Land Economics, the Transportation Journal, Business Horizons, and the Highway Research Record. The Institute of Public Utilities at Michigan State University published a revised version of my thesis which is titled Cost Considerations for Efficient Electricity Supply. I have also contributed to two other volumes, Regional Economic Effects of Alternative Highway Systems (Ballinger Publishing Co., 1974) and Studies in Electric Utility Regulation (Ballinger Publishing Co., 1975).

I have given speeches, workshops and papers to many groups, both academic and business. I have been a coordinator and lecturer in the American Gas Association's Annual Rate Fundamentals Course at the University of Wisconsin since 1971. The topics I have lectured on in this course include pricing, utility accounting, rate level determination, cost of capital and rate of return, and cost of service analysis. I also have lectured at other American Gas Association short courses.

1    During the past 20 plus years as a consultant, I

2    have worked on more than 400 rate and certificate cases

3    and have presented testimony more than 300 times.   I

4    have  testified  before  the  Federal  Communications

5    Commission,  the  Postal  Rate  Commission,  the  Federal

6    Energy  Regulatory  Commission  (FERC),  the  Interstate

7    Commerce Commission, the New York Planning Board, the

8    Dallas and Beaumont City Councils, and public utilities

9    commissions in 37 states, the District of Columbia, and

10   three Canadian provinces.   The cases involved electric,

11   gas, water, and telecommunications utilities.   I have

12   also  testified  in  oil  pipeline  and  taxi  cases.   My

13   testimony covered numerous subjects, including fair rate

14   of return, rate base, revenue requirements, revenue and

15   expense adjustments, pricing, and rate design.

16       In addition, I have been a consultant on numerous

17   other projects and studies, including a study of the

18   Uniform System of Accounts for telephone companies and

19   a study of entry and fare determination policies for the

20   taxicab industry in Washington, D.C.   Working for the

21   Development Advisory Service of Harvard University, I

22   advised  the  government  of  Colombia  on  public  utility

23   rates in 1969.   In 1977 to 1978, I directed a demand

24   study for the gas distribution utilities in New York.

25   Lastly,  I  managed  a  study  on  gas  rate  design  for  the

26   Economic Regulatory Administration in 1977 to 1978.

- 3 -

| 1 | | I have presented testimony before two Congressional |
| 2 | | committees, and  I was a member of two Federal Power |
| 3 | | Commission (FPC) National Power Survey Advisory |
| 4 | | Committees.  Also, I was Vice Chairman of the former |
| 5 | | FPC's Gas Policy Advisory Council-Transmission, |
| 6 | | Distribution and Storage (Technical Advisory Task Force- |
| 7 | | Rate Design). |
| 8 | Q. | What is your assignment in this case? |
| 9 | A. | I have been requested to develop a ratemaking method- |
| 10 | | ology for US Ecology's low-level radioactive waste |
| 11 | | ("LLRW") disposal site in Richland, Washington. |
| 12 | | Development of a ratemaking methodology entails the |
| 13 | | determination of a proper level of operating expenses, |
| 14 | | annual depreciation expense, an appropriate rate base, |
| 15 | | and a rate of return to be applied to that rate base. |
| 16 | | My testimony addresses the rate base and rate of return |
| 17 | | issues and I will testify accordingly. |
| 18 | Q. | Is US Ecology's LLRW operation in Richland a public |
| 19 | | utility? |
| 20 | A. | No, it is not.  The LLRW operation is an industrial type |
| 21 | | of company that has operated in a competitive industry |
| 22 | | for many years.  It is not characterized by economics of |
| 23 | | scale and does not require a public utility type of |
| 24 | | distribution network. |
| 25 | Q. | Should the rates charged by US Ecology at the Richland |
| 26 | | site be regulated at all? |

001292

1    A.    I will only answer that question from an economic

2            perspective. Up to now, there is no reason to regulate

3            the rates because there has been competition in the LLRW

4            industry. To the extent that regional compacts elimi-

5            nate competition in the industry, economic regulation is

6            probably necessary to prevent US Ecology from charging

7            monopoly prices.

8    Q.    Why do you say that economic regulation is "probably"

9            necessary?

10   A.    I say that because it may not be possible for US Ecology

11           to charge monopoly prices even if it is the only LLRW

12           operation in the Pacific Northwest. The site users may

13           have alternatives such as compaction or storage that

14           would not allow US Ecology to charge prices that are

15           higher than its incremental costs. In addition, there

16           is a facility in Utah that competes for some of the

17           waste that Richland currently handles.

18   Q.    What is the proper standard for ratemaking for US

19           Ecology?

20   A.    Rates should not exceed the level they would be at in a

21           competitive market. On the other hand, they should not

22           be below long-run marginal costs either.

23   Q.    What is marginal cost pricing?

24   A.    Marginal cost pricing has been defined as follows: "We

25           can define marginal cost very generally as the cost of

26           society's scarce resources which must be used to produce

1    one additional unit of some commodity or the value of

2    resources that would be saved by producing one less unit

3    of that commodity."[1]  I agree with this definition.  It

4    was taken from a decision of the New York Public Service

5    Commission, then chaired by Professor Alfred E. Kahn.

6         The concept is a simple one.  Prices set at

7    marginal cost act to guide consumers in their

8    consumption decisions to utilize their income to

9    maximize their well-being while, at the same time, using

10   the economy's resources in an optimal fashion.  Marginal

11   cost prices given consumers "signals" to value

12   commodities at their resource cost to the economy.  In

13   addition, producers receive the right quantity signals

14   and will tend to produce at optimal levels.  When this

15   occurs, the economy's limited resources produce the

16   maximum output in the sense of satisfying human wants.

17   Q.   What happens when prices are set below marginal cost?

18   A.   Two things happen, both of which are undesirable from an

19        economic viewpoint.  First, the low rates (relative to

20        marginal cost) encourage a higher level of consumption,

21        because customers usually respond to lower prices by

22        increasing their purchases of the good or service

23        involved.  The higher consumption is strictly a function

24,25,26,27,28   [1]Re Rate Design for Electric Corporations, NY PSC Case 26806, Opinion No. 76-15, 15 PUR 4th, 439-40, quoted by the Commission from the prepared testimony of Paul L. Joskow, p. 4.  The case involved the establishment of electric utility rate design and is widely viewed as a landmark decision in the proper application of marginal cost theory to utility ratemaking.

1    of the lower price and is therefore uneconomic. Second,

2    because more of the good or service in question is being

3    sold below the marginal cost price, more of it must be

4    produced. Since society's resources are limited, lesser

5    amounts of other goods and services that are valued more

6    can be produced. In other words, increased production

7    of the good or service in question requires a realloca-

8    tion of resources so that other goods and services must

9    be produced in lesser amounts. This causes a misalloca-

10   tion of resources because additional amounts of one good

11   or service are being produced at a marginal cost that

12   exceeds its value (i.e., the price that customers are

13   willing to pay), and this result must be accomplished by

14   producing reduced amounts of other goods and services

15   that have a value which exceeds their cost. In effect,

16   resources are being misallocated because of improper

17   price signals.

18   Q.   What happens when prices are set above marginal cost?

19   A.   A misallocation of resources occurs in this situation as

20        well, because too little of the good or service is

21        produced and consumed. The high price (relative to

22        marginal cost) results in lesser consumption because

23        consumers use less of the product than they would at the

24        marginal cost price. In turn, because less is being

25        consumed, less will be produced and the resources that

1   would have been used for that production will be

2   diverted to other uses.

3   Q.   Will marginal cost for the producer change over a period

4        of time?

5   A.   Yes, it is essential to make a distinction between

6        short-run and long-run costs.  The short run may be

7        described as a period within which the firm does not

8        alter its productive capacity, and the long run as a

9        period within which it expands capacity by building new

10       facilities.

11            As a firm operates a given plant to meet current

12       demand, its marginal costs are governed by the

13       additional labor, equipment, and fuel required.  If the

14       firm expands its plant, marginal costs will also include

15       depreciation charges and interest on the additional

16       investment.  The firm may handle short-run fluctuations

17       in demand by varying the rate of operation of its

18       existing plant, but investments in new capacity are

19       based on more persistent changes in demand.

20            There may be many short-run situations, such as the

21       increase or decrease in output for one week, one month,

22       or one season of the year, and the firm will normally

23       make different decisions for different periods.

24       However, in general there is only one long-run period,

25       because the "long-run" is defined as whatever period is

26       necessary for the firm to configure (or reconfigure) its

facilities and other inputs to meet anticipated demand more efficiently. In economics therefore the term "long-run" does not refer to any particular period of time but, instead, describes the concept of being able to vary all factors of production and treat all costs as variable.

Thus, the long-run is the period required for the firm to be able to leave a market, enter a market or achieve an optimally-designed system.

Q. Is there an optimal relationship between marginal cost in the long run and marginal cost in the short run?

A. Yes, the firm will realize its lowest possible costs when the expected short-run marginal cost and long-run marginal cost are equal. For example, if increased demand justifies larger output, the firm may have a choice between operating its present plant at a higher rate or expanding the plant's capacity by adding to it. It obviously should select the least costly of those alternatives.

Q. Do companies use marginal cost pricing concepts in their day-to-day operations?

A. I believe they do to some extent, depending on the relationship between costs and prices. But in many industries short-run marginal costs are low and overhead costs are high. In those circumstances competitive considerations determine prices. In other words, prices

- 9 -

1    are based on competitor's prices and not short- or long-

2    run marginal costs.

3           However, this does not necessarily mean that

4    marginal costs do not play a role in setting prices.

5    Companies respond to price signals by adjusting output

6    and by making capacity expansion/replacement decisions

7    on the basis of whether they expect the competitively-

8    determined prices to exceed their marginal costs. Thus,

9    competition will generally tend to drive prices down to

10   marginal cost, in particular the marginal cost of the

11   most efficient competitor. If competitively-determined

12   prices are expected to be less than the long-run

13   marginal costs of some competitors, those companies

14   would normally be expected to find a way to cut costs,

15   or ultimately to leave (or to be forced to leave) the

16   market.

17   Q.    What guidance can these theoretical principles of

18         marginal cost pricing provide to regulators of common

19         carriers, public utilities and businesses that are legal

20         monopolies?

21   A.    Let me begin my answer with a preliminary discussion.

22         As a practical matter, a regulator can set the price of

23         service in a regulated market anywhere within a range

24         whose bounds may be described with short-run marginal

25         cost as a floor and with demand price as a ceiling. The

26         task of the regulator is to find a set of prices within

1    this range that protects the customers from

2    monopolization and permits the business operation the

3    opportunity to recover its economic costs.

4   Q.   What are the issues which must be considered by a

5        regulator in selecting a rate or rates within this

6        range?

7   A.   If we start, as I believe we must, with the theoretical

8        tenet that efficient resource allocation requires prices

9        equal to short-run marginal cost, the regulator is faced

10       with two practical problems:  the problem of specifying

11       the short run and the problem of calculating costs over

12       any particular short-run.

13            The first problem analyzed in terms of how far

14       ahead the firm should look in identifying the correct

15       block of output that is to be priced.  The smallest

16       possible additional unit of sale becomes, in effect, a

17       rate of output per unit of time.  As the time element

18       shortens from some indefinite future to today, the shape

19       of the short-run cost curve changes.  Thus, there may be

20       a number of short number of short-run marginal cost

21       curves, each depending on the time horizon involved.

22            An example of what constitutes a very short run may

23       help to clarify this point.  An airline is faced with

24       the question of whether it should run an extra flight

25       from city X to city Y.  The average book costs of the

26       flight are $7,500;  the out-of-pocket costs of this

1           flight are $4,000. The revenue from the flight is

2           expected to be $6,100. Thus, the flight will add $6,100

3           to revenues and only $4,000 to costs. Overhead and

4           other costs totaling $3,500 ($7,500 minus $4,000) will

5           be incurred whether the flight goes or not. The average

6           costs of $7,500 are not relevant to this decision. It

7           is the marginal costs of $4,000 that count, and since

8           marginal revenue exceeds marginal cost the decision

9           should be to run the extra flight.

10    Q.    To take your airline example, does the airline continue

11           to make each pricing decision in the manner you have

12           described?

13    A.    No. If it did, it would probably become financially

14           weak and eventually go into bankruptcy as Eastern

15           Airlines did. Thus, when we move the very short period

16           of time to the so-called long run, price should include

17           all costs.

18    Q.    In what circumstances does the decision shift from a

19           short-run to long-run perspective?

20    A.    The transition from short- to long-run marginal cost

21           involves a lengthening of the decision period as output

22           expands and reaches capacity or as existing plant needs

23           to be replaced. Some costs that are fixed in the very

24           short term may become incremental costs over a longer

25           period if additional investments are required. In the

26           abstract, if a business knows its long-run marginal

1       cost, it can derive a minimum cost component for each

2       element of its demand and operate at the most efficient

3       level of output. The key is correct forecasting of

4       long-run demand and adjustment of capacity to that

5       demand. If a firm's rates are to include all costs,

6       whenever incurred, then those rates must be at least as

7       great as the long-run marginal cost.

8   Q.   Is long-run marginal cost appropriate as an across-the-

9       board standard for an LLRW operation?

10   A.   It may be. In a highly competitive industry that does

11       not have significant economies of scale, in the long-

12       run, prices will tend to be equivalent to long-run

13       marginal cost and the competing companies will expect to

14       be able to just recover their costs, including a

15       reasonable return on investment. However, as explained

16       in most standard economics textbooks, when there are

17       large economies of scale, as typically there are for

18       public utilities, each incremental addition to output in

19       the long-run can be added at a lower cost than previous

20       increments, causing long-run marginal cost to be less

21       than average cost. Consequently, if all rates are set

22       equal to long-run marginal cost, no competitor would be

23       able to recover its total costs.

24       In order to recover total costs in these

25       circumstances, rates on average must be equivalent to

26       long-run average costs. Clearly, if some rates are set

1    as low as long-run marginal cost, other rates must be

2    set above long-run _average_ costs.  But if there are no

3    economies of scale, long-run average costs should be

4    equal to long-run marginal costs.

5  Q.  So how would you summarize this range of permissible

6      rates?

7  A.  The short- and long-run periods are in their extremes

8      the opposite ends of a continuum within which the firm

9      carrier operates.  In the short run there may be

10     instances where marginal revenue exceeds marginal cost,

11     and perhaps contributes something toward fixed costs but

12     still falls short of fully allocated costs.  In the very

13     short term, when marginal revenue just equals marginal

14     cost, a price set at that coincidence becomes the

15     minimum or floor price for the service.  Further out of

16     continuum, as the time horizon lengthens, larger blocks

17     of the fixed cost must be included in the price.  In the

18     end, long-run marginal cost must cover all costs and be

19     reflected in the total demand price, which becomes in

20     effect the ceiling price.

21 Q.  How should the concept of marginal pricing be

22     implemented in this case?

23 A.  The Richland LLRW site has been in operation for a

24     number of years and could not be put in place at its

25     current level of book costs.  A reasonable approximation .

26     of long-run marginal cost can be estimated by combining

- 14 -

1       the capital costs of the proposed US Ecology site at

2       Needles, California with the operating costs of the

3       Richland site. As discussed in Mr. Sauer's Exhibit

4       ___(RES-6), the technology is similar at both locations.

5 Q.   What is the estimated cost of the California site?

6 A.   As explained in the testimony of Mr. Ash, the estimated

7       cost to develop the California site is $57.7 million.

8       After adjusting this figure to eliminate certain site-

9       specific costs, the capital cost to develop a new site

10      is $46.1 million.

11 Q.   Is the figure of $46.1 million appropriate to utilize

12      for rate base purposes for the Richland site?

13 A.   Yes, it is. If the Richland site did not exist, it

14      would cost on the order of $46.1 million to develop a

15      new site. Given that none of the states appear to be

16      anxious to develop new LLRW facilities, it is reasonable

17      to use the California figures as a proxy for the

18      investment cost of the Richland facility. Moreover,

19      these figures are in line with the costs expected to be

20      incurred at other new facilities being developed around

21      the country, as shown in Exhibit ___(RES-7) to Mr.

22      Sauer's testimony.

23 Q.   Is it appropriate to use the capital cost of the Needles

24      facility in combination with the operating expenses of

25      the Richland site?

1   A.   Yes, it is.  Both facilities are of similar design.

2        Operations will be comparable, and in my view, the

3        Richland expenses are appropriate to utilize for

4        ratemaking purposes.

5             The Needles facility has an expected life of 30

6        years.  The sublease under which the Richland LLRW

7        facility operates has a remaining term of 12.5 years.

8        In my view, it is appropriate to prorate the $46.1

9        million cost estimate at the Needles site using the

10       estimated lives of the two facilities.  Dividing the

11       12.5 year remaining term for the Richland facility by

12       the 30 year life for Needles results in a factor of

13       0.41667 to apply to the $46.1 million cost.   The

14       resulting rate base estimate is $19,202,000.

15  Q.   What is the appropriate depreciation expense to utilize?

16  A.   The appropriate depreciation rate is 8.0 percent; this

17       is the straight-line depreciation rate using a 12.5 year

18       remaining term.  When the rate of 8.0 percent is applied

19       to the $19,202,000 rate base, the resulting depreciation

20       expense is $1,536,000.

21  Q.   How should the rate of return be derived in this case?

22  A.   The appropriate rate of return should be based on the

23       risk of investing in an LLRW facility.  As a general

24       matter, there is considerable risk involved in investing

25       in a facility whose costs will be recovered over a long-

26       term period without comparable long-term contracts.  A

- 16 -

| 1 | | fair or appropriate rate of return that reflects the |
| 2 | | cost of capital and balances user and investor interests |
| 3 | | should be the goal. |
| 4 | Q. | How is the fair rate of return determined for a |
| 5 | | regulated enterprise? |
| 6 | A. | The fair rate of return is determined through the use of |
| 7 | | the cost of capital approach. Under the cost of capital |
| 8 | | approach, separate determinations are made of the cost |
| 9 | | of each type of capital utilized by the firm. If, for |
| 10 | | example, a company is financed with long-term debt, |
| 11 | | preferred stock, and common equity, the cost of each of |
| 12 | | these components is estimated individually. Then the |
| 13 | | cost rate of each component is weighted by the |
| 14 | | appropriate percentage that it bears to the overall |
| 15 | | capitalization. The sum of the weighted cost rates is |
| 16 | | the overall cost of capital and is used as the basis of |
| 17 | | the fair rate of return. |
| 18 | Q. | Please explain the steps you will follow in developing |
| 19 | | your recommended cost of capital for the Richland |
| 20 | | facility in this case. |
| 21 | A. | I begin by estimating an appropriate capital structure. |
| 22 | | Next I develop an estimate of the return on common |
| 23 | | equity that investors would require to invest in US |
| 24 | | Ecology using the discounted cash flow methodology. I |
| 25 | | then check the reasonableness of this estimate using the |
| 26 | | interest premium approach. |

001305

1     Q.    Dr. Olson, did you prepare an exhibit for use in this

2            case?

3     A.    Yes, I did. Exhibit ___(CEO-2) was prepared by me or

4            under by direction and supervision.

5     Q.    What materials did you utilize in the preparation of

6            your testimony?

7     A.    I reviewed the 1990 Annual Report to Shareholders for

8            American Ecology, US Ecology's parent. I also reviewed

9            the annual report and Value Line reports on the

10           comparable waste management companies that were used in

11           my cost of capital study.

12     Q.    Could US Ecology obtain debt financing to build an LLRW

13           facility such as the one that is under construction in

14           Needles, California?

15     A.    In my opinion, debt financing could not be obtained

16           without loan guarantees or long-term contracts with

17           financially solid users. Lenders would not be willing

18           to advance debt capital for a project that has

19           substantial environmental risks, significant public

20           opposition, and an undefined revenue flow. What this

21           means for rate of return purposes is that the investment

22           should be assumed to be equity financed. In other

23           words, the appropriate common equity ratio is 100

24           percent.

25     Q.    Please explain the methodology you will use to estimate

26           the cost of common equity capital in this case.

1  A.  Equity owners share in the residual that remains from

2     revenues after expenses, including interest, are paid.

3     Thus, there is no contractual relationship as to

4     required earnings between the common stockholder and the

5     corporation.  Earnings on equity can only be judged in

6     terms of whether they produce market prices for the

7     common shares that permit capital attraction on terms

8     that are considered fair and reasonable.

9     From an investor's viewpoint the cost of common

10    equity of a given company is the minimum expected return

11    which will induce him to buy stock at the going market

12    price.  For example, if an investor will buy a stock

13    that is selling at $20.00 per share but will not buy it

14    at a higher price, and expects to receive 40¢ in

15    dividends and to sell it at exactly one year at $22.80,

16    the cost of capital is 16 percent, as shown below:

17    Dividend Yield =    ($ .40 / $20.00)   =    2%
18    Growth         =    ($22.80 / $20.00)-1 =   14
19
20    Cost of common equity (k)               =    16%

21    Unfortunately, the task is not this easy because we do

22    not know what investors really expect when they decide

23    to buy a given stock.

24    In my opinion, the most reasonable way to go about

25    estimating the cost of common equity is to utilize the

26    discounted cash flow (DCF) approach.  The DCF approach

27    to estimating the cost of equity capital is based on the

28    premise that the investor is buying two things when he

- 19 -

purchases common stock, dividends and growth. Investors in American corporations have come to expect growth in earnings and dividends per share of common stock because of a public policy that is committed to increasing Gross National Product. In addition, the experience of most U.S. corporations since the end of World War II has been one of increased dividends and earnings per share. The cost of equity capital using the discounted cash flow method is that discount rate which equates a given market price of a stock with the expected future flow of dividends.

The discounted cash flow method is frequently expressed as a formula in which k, the cost of capital, is equal to D/MP, the dividend yield, plus, g, expected growth. Thus:

$$k = D/MP + g$$

In utilizing this formula it must be assumed that g cannot exceed k because that implies negative dividends. It must also be assumed that a growth rate, g, that is equivalent to a constant rate of growth to infinity can be estimated. Mathematically this is true, but it is not important for purposes of application.

Implementation of the DCF approach requires the exercise of considerable judgment concerning the views of investors. The real question is what affects investor expectations. Estimating investor expectations

- 20 -

1    is a difficult task because of the many factors that

2    affect capital markets in general and common stocks in

3    particular.   The current state of the economy, the

4    Federal deficit, fiscal policy, expected inflation,

5    foreign exchange rates, and Federal Reserve Board policy

6    all impact significantly on investor judgments.   In

7    addition to these factors, the appropriate return on

8    equity is governed by all of the specific factors that

9    influence a firm's particular situation.

10   Q.   Is the DCF method the only approach you consider in

11        determining the cost of common equity capital for the

12        Richland facility?

13   A.   No, I review and analyze all the information that is

14        available in estimating the cost of common equity

15        capital.   In this regard, I will present an interest

16        premium check on my DCF estimate of the cost of equity

17        for US Ecology.   However, it is my view that the DCF

18        approach is the best single method for determining the

19        cost of equity capital.

20   Q.   What information is available and useful for purposes of

21        making a DCF estimate of the cost of common equity

22        capital in this case?

23   A.   We know and presumably investors are aware of current

24        conditions in the economy.   Significant factors are the

25        Federal deficit, the current trade deficit, concerns

1    about higher inflation, unemployment, and uncertainty

2    regarding fiscal and monetary policy.

3        The federal budget deficit has been at record

4    levels.  At the end of fiscal year 1991 (September 30,

5    1991) the federal debt was approximately $3.66 trillion.

6        The 1990 trade deficit was $101.7 billion.  This

7    level is lower than that experienced in recent years,

8    but high by historical standards.   The 1991 trade

9    deficit was approximately $66 billion.

10        The U.S. unemployment rate in January 1992 was 7.1

11   percent.  This is above the range which describes the

12   natural or expected rate of unemployment.  The natural

13   rate of unemployment, currently thought to be 5 to 7

14   percent, is the rate at which there is no tendency for

15   inflation  to  accelerate  or  decelerate.   With

16   unemployment above 7 percent, the inflation rate should

17   decline.

18        After reaching double-digit levels in 1979 and

19   1980, consumer prices increased by 8.9 percent in 1981

20   and by only about 3.8 percent in 1982 to 1985.  The very

21   low inflation rate of 1986 of 1.1 percent reflected a

22   substantial decline in energy prices.  With the rebound

23   of energy prices and the increasing prices of non-oil

24   imports, which reflected the decline in the value of the

25   dollar, the increase in consumer prices in 1987 was 4.4

26   percent.  The 1988 increase also was 4.4 percent.

Inflation remained moderate at 4.6 percent in 1989, although the cost of medical care increased sharply. As a result of the Iraqi invasion of Kuwait in August 1990, oil prices increased from $22 a barrel to $40 per barrel in mid-October. They declined to about $28 a barrel by the end of the year. Prices for consumer services continued to increase at a faster pace than those for consumer goods, but wage inflation moderated. The rate of increase in the consumer price index in 1990 was 6.1 percent. During 1991, the rate of increase in consumer prices declined to 3.1 percent, in large measure as a result of the recession. For 1992, the consensus estimated increase in consumer prices is currently 3.2 percent according to the February 10, 1992 issue of Blue Chip Economic Indicators. Schedule No. 1 provides a summary of changes in the CPI over the last decade and the predicted figures for 1992 and 1993.

During 1980, there was a sharp but short recession that lasted less than six months. After a rebound, the economy entered another recession in July 1981. Real GNP grew by 1.9 percent in 1981 but fell 2.5 percent in 1982. The recession ended in November 1982. In 1983, the first full year of recovery, gains in output were widespread across most sectors of the economy; real GNP grew 3.6 percent. Real GNP growth accelerated to 6.8 percent in 1984; it fell to 3.4 percent in 1985. Real

- 23 -

economic growth continued at a slower pace in 1986; the increase was 2.7 percent.

In 1987, real GNP growth increased by 3.4 percent, and the source of growth shifted from the domestic to the foreign trade sector. In October 1987, the current expansion became the longest peacetime expansion of the postwar era. The composition of demand in 1988 continued the trends begun the year before; the rate of increase in real GNP was 4.5 percent. The more moderate expansion of real GNP in 1989 -- the increase over 1988 was 2.5 percent -- reflected slower growth in interest-sensitive sectors and in government purchases. Economic expansion ended in the third quarter· of 1990 and GNP growth for the year was 1.0 percent. The timing at the downturn may have been influenced by the problems in the Middle East. However, the economy was sluggish before the invasion of Kuwait as the result of other factors, notably the size of the federal budget deficit.

In 1991, the U.S. Government decided to report changes in Gross Domestic Product (GDP) rather than changes in GNP. This statistical change in reporting is intended to better reflect changes in U.S. economic conditions. To be specific, GDP measures the value of items produced within the borders of the U.S.; GNP measures the output of residents of the U.S. Thus, GNP includes the income of corporations and individuals

working abroad and excludes income earned within the borders of the U.S. by foreigners.

Real GDP hardly increased in 1991; the rate of increase was 0.2 percent. The consensus estimated change in real GDP for 1992 is 1.6 percent, and in 1993 real GDP is expected to increase by 3.2 percent, according to the Blue Chip Economic Indicators. GDP data for the 1980 to 1993 period are shown on Schedule No. 2.

Money supply (M2) growth was slower for 1984 and 1985 than in the early part of the 1980s. The rate of growth increased in 1986, but slowed considerably in 1987. Money supply growth was greater in 1988 than in 1987, but was below the levels experienced in the beginning of the decade. In 1989 and 1990, the rates of growth generally declined. The Federal Reserve Board's current target for the M2 money measure is 2.5 to 6.5 percent. M2 growth was 3.1 percent in 1991; this figure is near the low end of the target range. Growth data for the M2 measure of money supply are shown on Schedule No. 3.

Finally, long-term interest rates have declined substantially since the early 1980s, and have varied within a relatively narrow range since then. During 1991 interest rates were somewhat lower than they have been in recent years. The yields on 30-year U.S.

1   Treasury bonds and Moody's public utility bonds are

2   shown on Schedule No. 4.

3       The type of information discussed at some length

4   above is available in detail.  Presumably, investors

5   utilize it, understand the state of the economy, and

6   have their own opinions about GNP growth, interest

7   rates, and other factors.  These influence their return

8   expectations, and thereby determine the maximum price

9   they will pay for various types of securities.  Thus,

10  because investors take the economic situation into

11  account in their decision-making, information concerning

12  the economy is reflected in the prices of stocks and

13  bonds at any given time.

14      If the discounted cash flow methodology is employed

15  to determine the cost of equity capital in this case,

16  the significance of the economic situation is properly

17  thought of in terms of its effect on the share price of

18  the  common  stock  and  the  formulation  of  investor

19  expectations.  Just exactly how economic information is

20  translated into share prices is not clear.  But it is

21  evident that, to the extent investors are rational, they

22  at least make their best judgment as to the effect of

23  economic  conditions  on  their  buying  and  selling

24  decisions.

25  Q.  You have explained that you utilize the DCF approach for

26      purposes of determining the cost of common equity

1　　　　capital.  You have also indicated the kinds of economic

2　　　　information  that  investors  consider  in  analyzing

3　　　　potential  investments  and  how  this  information  is

4　　　　"embedded" in security prices.  Would you now explain

5　　　　how you will apply the DCF approach in this case?

6　A.　　Yes.   The rates at issue in this case are for US

7　　　　Ecology's Richland LLRW.  However, since US Ecology's

8　　　　parent, American Ecology, is traded over the counter and

9　　　　does not pay a dividend, it is difficult to obtain the

10　　　information necessary to determine the cost of equity

11　　　capital.   Further,  there  are  no  publicly  traded

12　　　companies that have risk comparable to American Ecology.

13　　　I decided that the best group to employ is a publicly

14　　　traded group of companies involved in the sold waste

15　　　business.   I chose the group from the environmental

16　　　group reported in Value Line.  I excluded companies that

17　　　do  not  operate  solid  waste  disposal  facilities.   I

18　　　consider my approach to be conservative because those

19　　　companies  are  larger  than  US  Ecology  and  operate

20　　　numerous  facilities.   This  acts  to  diversify  their

21　　　risks.

22　Q.　What  market  information  is  available  to  investors

23　　　regarding these companies?

24　A.　Investors are likely to have the following information:

25　　　　　　　　(1)　Market price data for their common shares

26　　　　　　　　(2)　Past and present dividends

- 27 -

1          (3)   Past and present earnings

2          (4)   Past, present, and forecasted capital

3                expenditure data

4          (5)   Short-term forecasts by security analysts for

5                earnings and dividends.

6  Q.  How is this information utilized by investors?

7  A.  It is reasonable to assume that it is utilized in

8      investment decision-making. In all likelihood, the more

9      recent the information, the more weight it is given.

10      However, it is not reasonable to expect that past trends

11      are ignored. In addition to the above market

12      information, investors are aware of public statements

13      made by the management of these companies and know that

14      they are involved in regulatory proceedings and court

15      actions.

16  Q.  Please explain how you have implemented the DCF approach

17      in your analysis of the cost of common equity for US

18      Ecology.

19  A.  I begin by considering the dividend yield for the

20      comparable companies. Schedule No. 5 shows the dividend

21      yield for these companies for the period July 1991 to

22      December 1991. Schedule Nos. 6 through 10 present

23      detail by company. The average yield for the 5

24      companies is 1.72 percent. The yields range from a low

25      of zero to a high of 3.24 percent. The time period

26      employed reflects the most recent six months of

1    available data.   In theory a current dividend yield

2    reflects all information relative to the risk of common

3    shares that is available to investors.  However, due to

4    the general volatility of stock market prices, it is

5    preferable to attempt to obtain an average that smooths

6    short-run  fluctuations.    This  yield  is  properly

7    increased by one-half the expected growth rate.   The

8    purpose of this adjustment is to project dividends

9    forward to the mid-point of the upcoming year, since it

10   is forward dividends that are properly employed in the

11   DCF model.

12   Q.  Please explain how you derived your estimated growth

13       rate for use in this case.

14   A.  Investors consider both yield and growth when they

15       purchase common stock.   The growth they base their

16       purchase decisions on is their perception of future

17       growth for the company in question. The growth estimate

18       may be based on past growth rates but it may also be

19       based on a perception of the future that differs

20       considerably from the past.   In the case of the 5

21       comparable waste management companies, investors have a

22       great deal to ponder relative to the future because of

23       changing environmental considerations in California and

24       nationally.

25           For  an  indication  of  future  earnings  growth

26       expected by investors, I looked to the Institutional

1    Brokers Estimate System (IBES) estimates of 5-year

2    projected earnings growth. The IBES data, published by

3    Lynch, Jones & Ryan in New York, are consensus figures

4    based on estimates produced by analysts from the

5    research departments of leading Wall Street brokerage

6    firms.    The consensus estimates are presented in

7    Schedule No. 11; the individual company averages range

8    from 15.0 to 25.0 percent; the medium for the 5

9    companies is 20.0 percent.

10   Q.   Dr. Olson, what is your conclusion as to the proper

11        growth rate to utilize in combination with the 1.72

12        percent dividend yield you estimated earlier?

13   A.   In my opinion the appropriate growth rate to utilize for

14        the comparable companies is 15.0 to 17.0 percent. This

15        is about at the level of projected earnings growth

16        rates.

17   Q.   What is the investor return requirement for US Ecology

18        using the comparable companies you have chosen in this

19        case?

20   A.   Combining the dividend yield, yield adjustment and

21        growth rates described above, the investors' return

22        requirement for the comparable companies is between

23        16.85 and 18.87 percent, calculated as follows:

| | | |
|---|---:|---:|
| Yield | 1.72 | 1.72 |
| Yield Adjustment Factor, equal to the yield times one-half the growth rate | .13 | .15 |
| Expected Growth | 15.00 | 17.00 |
| Investor Required Return | 16.85% | 18.87% |

Q. Dr. Olson, please describe your check of the 16.85 to 18.87 percent investor return requirement you derived using the DCF approach.

A. My check on the estimated investor requirement is obtained using the interest premium approach. Common stocks are more risky than bonds. Consider the case of a given corporation. The bondholder has a prior claim on the assets of the company in the event of bankruptcy as well as on the earnings of the company while it is in operation. The common shareholder receives the residual earnings from operations. The bonds of a corporation are thus less risky than the common shares.

In The Stock Market: Theories and Evidence (published in 1973), Lorie and Hamilton have made the following observation at page 214:

> It is perfectly clear that bonds are less risky than stocks when both classes of securities are issued by the same corporation. Since bondholders have a prior claim to the earnings and assets of the corporation the rates of return on bonds are less variable and more confidently predicted than rates of return on the common stock. This fact is so obvious that it has not been studied and does not require study.

The same point has been made by Myers:

1      Interest rates on corporate bonds and other
2      debt instruments can be readily observed to
3      provide a floor for the estimate.  Changes in
4      the basic level of interest rates normally
5      correspond in direction to changes in the
6      cost of equity capital.  (Stewart C. Myers,
7      Bell Journal of Economics, Spring 1972, p.
8      65.)

9  The next question is how much of a premium over the

10  bond yield should the stock carry.  In Stocks, Bonds,

11  Bills and Inflation:  1991 Yearbook, Roger G. Ibbotson

12  has shown that common stocks have produced returns that

13  average 6.6 percentage points more than corporate bonds.

14  Adding this figure to the average yield of Moody's Baa

15  rated industrial bonds for 1991 of 10.0 percent produces

16  an equity return requirement of 16.6 percent.  However,

17  that figure is a low estimate of the return requirement

18  for US Ecology because the Richland facility could not

19  issue stand-alone debt at a cost rate of 10.0 percent.

20  Q.  Is the 16.8 to 18.9 percent (rounded) investor

21  requirement the cost of common equity capital to US

22  Ecology?

23  A.  No.  The 16.8 to 18.9 percent investor requirement

24  should be increased so that equity capital could be

25  obtained, if necessary, without dilution.

26  A financing cost adjustment must be applied to the

27  entire investor requirement (in this case 16.8 to 18.9

28  percent) in order to avoid dilution on a given issue.

29  This can be seen by using a single example:  assume that

30  a firm has a book value of $25.00 per common share and

- 32 -

financing costs are 5 percent of the issue price. If a return on common equity that is just equal to the investors' requirement is authorized and earned, the shares will trade at $25.00. If new shares are issued, net proceeds will be $23.75 per share ($25 times 95%); this, of course, dilutes the investment of the existing shareholders. In order to avoid dilution, the share price must be increased 5 percent, this is done by increasing the investors' required return by 5 percent.

The cost of common equity capital should properly include a component for financing costs. I recognize that American Ecology did not issue common stock to finance their investment in this project. However, the Commission should recognize that the American Ecology has numerous alternative investment opportunities. Because there is an opportunity foregone due to this investment, the cost associated with external financing is properly included in the return on equity.

Q. What rate of return on equity capital do you recommend for US Ecology in this case?

A. In my opinion the rate of return for US Ecology is between 17.5 and 19.5 percent. This figure does not include any implicit allowance for attrition, i.e., it must be earned during the rate effective period if capital is to be attracted on reasonable terms. In my view this means that rates should be set that will cover

1    US Ecology's costs during the period when the proposed

2    rates are in effect and allow the recommended return on

3    common equity to actually be earned.

4    Q.    Do you have a recommendation regarding the inflation

5          index to be used to adjust US Ecology's expenses?

6    A.    Yes.    The 1991 legislation requires that a "common,

7          verifiable price index" be used as a measure of

8          inflation to periodically adjust the Company's base

9          disposal rate.    I recommend that the Implicit Price

10         Deflator for Gross Domestic Product (the "GDP Deflator")

11         be used.    This is a widely used price index published by

12         the U.S. Department of Commerce which provides a

13         reasonable measure of the general inflation level

14         experienced by the Company in its LLRW operations.

15   Q.    Does this conclude your testimony?

16   A.    Yes, it does.