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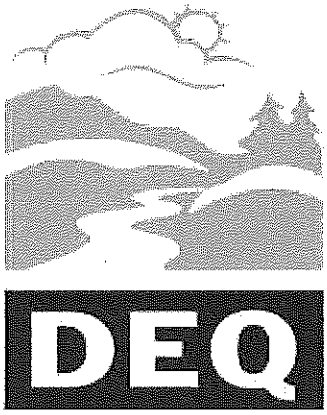
OREGON
ENVIRONMENTAL QUALITY
COMMISSION MEETING
MATERIALS 03/15/1995



State of Oregon
Department of Environmental Quality

- N O T I C E -

Special Telephone Conference Call Meeting

ENVIRONMENTAL QUALITY COMMISSION

Wednesday, March 15, 1995

3:30 p.m.

The Commission will meet by telephone conference call for the purpose of considering a request from the U. S. Fish and Wildlife Service to spill water over the Bonneville Dam for 10 days commencing on March 16, 1995, to assist out-migrating Spring Creek hatchery chinook salmon smolts.

The public may attend the conference call at the following location:

Conference Room 3A
Department of Environmental Quality Offices
811 S. W. Sixth Avenue
Portland, Oregon 97204

NOTICE

EXECUTIVE SESSION MEETING
ENVIRONMENTAL QUALITY COMMISSION

Pursuant to the Oregon Public Meetings Law, ORS 192.610 to 192.690, the above referenced executive session meetings shall be closed to all except members of the Environmental Quality Commission (EQC), persons reporting to the EQC, pre-scheduled candidates, and news media representatives. The EQC may direct that specified information from this executive session is not to be disclosed. ORS 192.660(3).

Monday, March 13, 1995

3:30 p.m. - Conference Call*

Statutory Authority: **ORS 192.660(1)(a)**

Subjects to be discussed: The Commission will deliberate about the selection of the Department of Environmental Quality director.

* The Executive Session will be held via a conference call; length of the session is uncertain.

State of Oregon
Department of Environmental Quality Memorandum†

Date: 3/15/95

To: Environmental Quality Commission

From: Lydia Taylor, Interim Director

Subject: Agenda Item A, EQC Meeting

Petition for modification to total dissolved gas criteria as provided by OAR 340-41-205,445,485,and 525 (2)(n).

Statement of the Issue

The Commission is petitioned by the United States Fish and Wildlife Service (USFWS) to increase the current 110% maximum TDG criteria to a twelve (12) hour average criteria of 115% saturation. The increased criteria would allow for greater spill at Bonneville Dam to increase the relative survival of out migrating salmon from the Spring Creek Hatchery.

Background

Additional spill for the Spring Creek Hatchery release has, apparently, been a standard procedure for several years.

The Environmental Quality Commission (EQC) modified administrative rules on February 16, 1995 allowing itself to modify the TDG criterion in the Columbia River for the purpose of aiding juvenile salmonid migration.

The USFWSs petitions the EQC for modification of the TDG criteria for the Columbia River to provide for additional spill to aid the migration of 7,500,000 juvenile Chinook Salmon from the Spring Creek hatchery. The USFWS anticipates that these juveniles will contribute approximately 82,500 adults (1.1%) to nearshore and local fisheries. According to USFWS, these fish make up a large contribution to the US/Canada treaty production.

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†Accommodations for disabilities are available upon request by contacting the Public Affairs Office at (503)229-5317(voice)/(503)229-6993(TDD).

The petition requests a criteria of 155 percent TDG based on an average of the 12 highest hourly measurements of TDG as measured at Warrendale for a period of 10 days from March 17 to March 26, 1995. The proposed increase to the TDG criteria enables an increased spill which would achieve the fisheries agency goal of 80% fish passage efficiency (FPE).

The USFWS estimates a 5 percent increase in the relative survival of migrating Spring Creek hatchery chinook juveniles (as the result of increased spill allowed by the proposed criteria). Increased survival results from a greater percentage of the fish passing Bonneville over the spillway as opposed to going through the turbines. Higher survival rates are associated with spillway passage as compared to turbine.

Monitoring of TDG will be conducted by the United States Army Corp of Engineers (USACE) at several stations below Bonneville as follows:

Table 1

Location	River Mile
Bonneville	146.1
Warrendale	140.0
Camas/Washougal	122.0
Kalama	77.0
Wauna Mill	42.0

No biological monitoring is proposed as part of the petition. Neither does the petition address the presence, or potential risk to adult migrating salmon.

Schedule of Events:

The pending petition was noticed as a Chance to Comment on 3/7/95
The petition was received by DEQ and made available to the public for comment on 3/10/95
Public comments were due by 12:00 noon on 3/14/95
The Department summarized and reviewed the comments received and made them available to the Commission members on March 14, 1995.
The EQC meets by Conference call at 3:30 pm 3/15/95

Summary of the Department's Review of the Petition:

The Department's review of the petition is attached as Appendix B.

The petition does not provide any new substantive information justifying modification to the TDG criteria. Much of the limited information provided in the justification could not be verified. The supporting information and documentation was weak. The petition correctly observes that the limited duration of the spill, and probable normal TDG levels downstream of the proposed reference point will result in limited exposure to elevated TDG for the out-migrating smolts. The exposure period influences the degree of impairment, and risk of gas bubble disease, from elevated levels of TDG. Although not discussed in the petition, adult Steelhead and Spring Chinook salmon will be present below Bonneville during the 10-day spill period.

The proposed TDG criteria is similar to those previously adopted by the Commission under emergency rule actions in 1994. In responding to the request the Commission may reasonably rely upon its own knowledge gained from previous deliberations; the Department's review of the petition; and public comment, to determine the potential risk from a maximum 12 hour averaged TDG level of 115 percent. However, no biological monitoring will occur to verify the effect, if any, of the elevated TDG.

The relative increase in juvenile survival of 5 percent claimed by USFWS could not be verified. The base conditions and assumptions upon which the USFWS derived it's estimates were not presented. The Department's review consisted of deriving independent assumptions, and inferring the USFWS reference condition and assumptions. The Department used a base condition of the relative amount of fish passing the dam by a spill under conditions designed to meet the state's water quality standard of 110 percent TDG. This assumption resulted in a lower estimate of 1.1 percent of increased juvenile survival than presented by the USFWS.

The Spring Creek Hatchery fish are not endangered. The benefits of the increased spill may then be measured as the number of adults provided to the nearshore and local fisheries. The relative increase in adults provided to the fishery was estimated using a conversion of 1.1 percent provided by the USFWS. This conversion was multiplied by the estimated increase in juvenile survival resulting from the increased spill. The USFWS estimates of juvenile survival result in an estimated increased adult catch of 4,125 fish. The Department estimates an increased catch of 900 - 1,100 adults compared to spill levels established to maintain TDG at or below current state criteria. Both estimates assume no detrimental impacts on survival of juveniles to the estuary due to

TDG. The Department's estimates do not include differential mortality due to predation, or differential mortality due to passage via bypass systems rather than spill or turbine passage.

No information was provided in the petition on the potential costs associated with the proposed spill. Personal communication between Russell Harding of DEQ and Roger Sheeleigh of Bonneville Power Administration suggest the cost of foregone revenues as a result of this spill at between $500,000 and $1,500,000 depending on flow and spill duration. BPA is working on an estimated loss of $1 million as a result of this spill. These unverified cost estimates when compared to the uncertain estimates of adults to the fisheries made by DEQ result in an incremental cost in the range of $500 to $1,500 per fish. Similarly, using the unverifiable estimates of relative increased survival from USFWS results in a lower range of $121 to $363 per fish.

Alternatives and Evaluation

There are four alternatives:

1) Accept the petition;
2) Reject the petition based on inadequacy of supporting information;
3) Accept the petition based on the Commission's understanding of the risk to fish and aquatic life from previous deliberations on TDG issues for the Columbia River, the limited information contained in the petition, information provided during the public review process, and the Department's summary of the petition;
4) Accept the petition with modifications based on the Commission's understanding of the risk to fish and aquatic life from previous deliberations on TDG issues for the Columbia River, the limited information contained in the petition, information provided during the public review process, and the Department's summary of the petition.

Accepting the petition would be perceived as an endorsement of the quality and timeliness of the submittal. This endorsement may be perceived as the Commission's decision to accept petitions from federal agencies without regard to the scientific merit contained in the petition.

Rejecting the petition based on inadequacy is not unreasonable. The petition did not contain to any degree the supporting material necessary to justify modification to the State's Water Quality Standard. Lack of adequate time for developing the petition is not

a reasonable excuse. The Spring Creek Release is not a new issue, and the USFWS service has been aware of the need for petition for an extended period.

The Commission has previously been presented with substantial information on the benefits of spill, and the concerns with elevated levels of TDG. It is reasonable to expect the Commission to draw from this knowledge. Although extremely limited, the petition does contain information relative only to the proposed Spring Creek hatchery release that may influence how the Commission reflects upon past decisions. The hatchery fish are not endangered. The spill is only occurring at Bonneville, and there is less area at risk from elevated TDG compared to past emergency rule modifications. The 10-day period of the spill would result in limited exposure periods which would act to reduce the risk associated with the proposed moderate levels of TDG.

Option four is similar to option three, but would include modifications to the request based on the Commission's knowledge from past deliberations, the Departments review, and public comments. Modifications that should be considered include:

Clarification that the modified TDG is for below Bonneville dam only;

Identification of a maximum cap, and reference where measurements are to be taken, and

Clarification that the TDG measurement is the simple average of the 12 highest hourly readings within any one calendar day, and the maximum is the highest hourly reading within any one calendar day.

A requirement that biological monitoring take place.

Summary of Public Comment

The public comment is evaluated and discussed in attachment C

The Commission will give public notice and notify all known interested parties and will make provisions of opportunity to be heard and comment on the evidence presented by others...

1 Except, TDG Rules

Necessary Findings

The Commission must make four specific findings identified in the appropriate rules (i) through (iv)

2. that no single hourly reading shall exceed 120 percent at the USACE historical monitoring station at Warrendale, Oregon;

3. that monitoring shall take place at Warrendale, Camas/Washougal, Kalama, and Wauna Mill;

4. that this modification shall be effective from 8.00 pm on March 17, 1995 until 8.00 pm on March 26, 1995; and

5. that the applicant shall provide the following biological monitoring for gas bubble trauma:

   a) during the spill program, two sites on each side of the Columbia River, between one and three miles downstream of Bonneville Dam, shall be sampled daily;

   b) a minimum 100 fish total, and a maximum of 100 fish per species, shall be sampled by beach seine or other appropriate device and examined externally for signs of GBD;

   c) a daily subsample of five each of the hatchery and at least two species of resident fish shall be sacrificed and examined for internal evidence of GBD.

   d) the applicant shall report to the Department on a daily basis the results of the prior day's sampling and evaluation;

   e) the Director will require the spill program to cease immediately if any hatchery or resident fish show signs of GBD;

6. that this order applies only to waters below Bonneville Dam.

Attachments

A Proposed Commission Order (if any)
B Departments Review of USFWS Petition
C Departments summary and evaluation of public comment

Approved:

Section: _____

Division: _____

Report Prepared By: Harding, Russell

Phone: 229-5284

Date Prepared: 14 March 95

RH:crw
SA\WC13\WC13322.5

Attachment A

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

In the matter of the USFWS request to spill water to assist out-migrating Spring Creek hatchery smolts	(((((	ORDER

WHEREAS the Department of Environmental Quality received a request from US Fish & Wildlife Service (USFWS) on March 7, 1995, to adjust the Total Dissolved Gas (TDG) standard as necessary to spill over Bonneville Dam for 10 days, commencing on March 17, 1995, to assist out-migrating spring Creek hatchery salmon smolts; and

WHEREAS the USFWS submitted its justification for the spill on March 9, 1995; and

WHEREAS the public was notified of the request on March 7, 1995 and given the opportunity to submit written comments until noon on March 14, 1995; and

WHEREAS the Environmental Quality Commission (EQC) met on March 15, 1995 and considered the request, justification, and all public comment:

THEREFORE the EQC orders as follows:

1. The Commission adopts as its own findings the materials contained in the staff analysis attached.

2. The Commission approves a modification of the TDG standard subject to the following conditions:

   a. that the TDG criteria shall be a simple average of the highest 12 hourly readings within any calendar day not to exceed 115 percent;

   b. that no single hourly reading shall exceed 120 percent at the USACE historical monitoring station at Warrendale, Oregon;

   c. that monitoring shall take place at Warrendale, Camas/Washougal, Kalama, and Wauna Mill;

   d. that this modification shall be effective from 8.00 pm on March 17, 1995 until 8.00 pm on March 26, 1995; and

e. that the applicant shall provide the following biological monitoring for gas bubble trauma:

1) during the spill program, two sites on each side of the Columbia River, between one and three miles downstream of Bonneville Dam, shall be sampled daily;

2) a minimum 100 fish total, and a maximum of 100 fish per species, shall be sampled by beach seine or other appropriate device and examined externally for signs of GBD;

3) a daily subsample of five each of the hatchery and at least two species of resident fish shall be sacrificed and examined for internal evidence of GBD.

4) the applicant shall report to the Department on a daily basis the results of the prior day's sampling and evaluation;

5) the Director will require the spill program to cease immediately if any hatchery or resident fish show signs of GBD;

f. that this order applies only to waters below Bonneville Dam.

Dated: _____

ON BEHALF OF THE COMMISSION

_____

Lydia Taylor, Interim Director

Review of the USFWS Petition to Modify
the State's Water Quality Standard for Total Dissolved Gas (TDG)
for the Columbia River for the Purpose of Aiding Juvenile Chinook
Salmon Released From the Spring Creek Hatchery.

Overall Review:

The review summary is presented in the EQC memorandum. The review of the petition is divided into six (6) sections:

TDG Criterion, Location, and Averaging Period
Justification for TDG Criteria
Survival Calculations
Adult Salmonids Present
Supporting Material, and
Biological Monitoring

In addition, since it is anticipated to be brought up as an observation or issue, a discussion of the Willamette River fish kill associated with elevated TDG from high flows over Willamette Falls is presented.

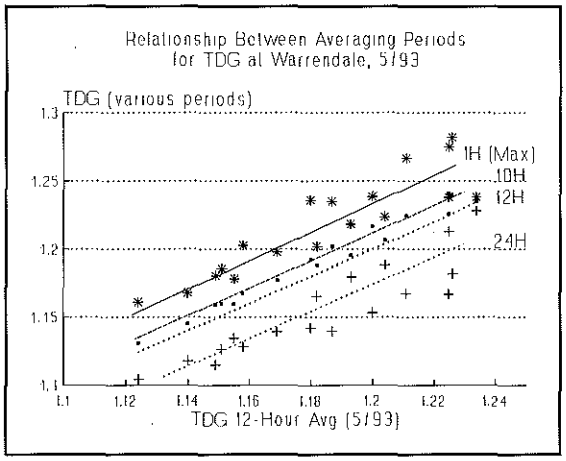
TDG Criterion, Location and Averaging Period:

The USFWS proposes an average of the higher 12-hour TDG recordings of 115% TDG as measured at Warrendale. The USFWS suggests that this cap should maintain instantaneous maximum TDG levels below 125% TDG.

Alternative locations for monitoring TDG are not discussed. However, the monitoring plan states that USACE will monitor several locations below Bonneville.

During the 1994 spill program, several locations below Bonneville were monitored. The Warrendale, Oregon site, tended to record higher daily averages than the other historical monitoring locations. However, the Skamania site (Skaw), in Washington State, frequently had higher TDG levels than did Warrendale.

The USFWS request identified no specific maximum cap as part of an alternative TDG criteria. The request implies that the 115% (12-highest hour average) TDG criteria would maintain maximum TDG below 125%. The importance of defining a maximum cap was discussed during the deliberations that led to rules modifying TDG criteria for the Columbia River.



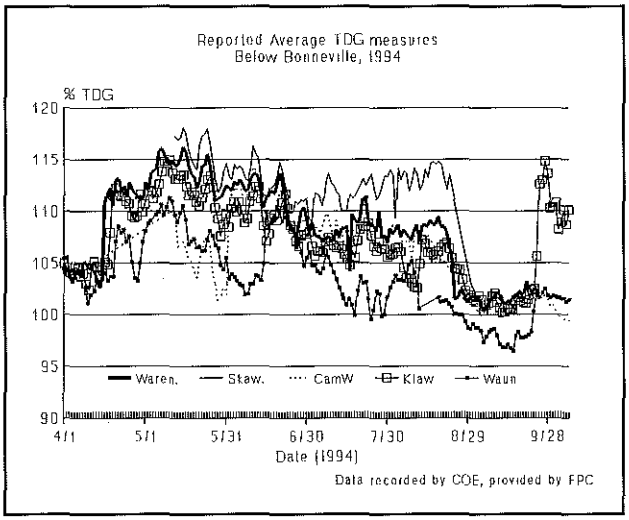
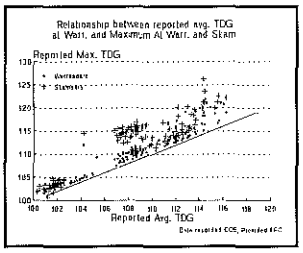


Figure 1 Daily Avg TDG below Bonneville (1994)

The relationship between the average of the 12 highest TDG measurements and other averaging periods is illustrated in figure 2. Hourly data for May of 1993 was used to determine the illustrated relationships and the highest hourly average is labeled as maximum. This data suggest that a 115% TDG (1.15) should maintain maximum TDG below 120% TDG. Because of the 12-hour spill cycle the 10 maximum hour average would be similar to a 12 maximum hour average.



Similarly, data collected during the summer of 1994 suggest that average of 115% at Warrendale would result in daily maximums at Warrendale of less than 120% TDG, and the maximum as recorded for Skamania of less than 125%

There appear to be several options:

Do not identify a maximum: DEQ staff do not recommend this option.
The deliberations on rules enabling modification to the TDG criteria is too recent for any reasonable person to believe the DEQ forgot the previous advice to the Commission. No information has been submitted to suggest a maximum criteria cap is not a reasonable component for the TDG rule.

Identify a 125% TDG cap: A level of 125% approaches a threshold above which field bioassay show significant mortality occurring over exposure periods of one to several days. Since the monitoring plan is not well described, it would appear that limited data would be available to determine where maximum TDG levels occur.

Identify a 125% TDG Cap for Warrendale: Review of available data suggests that if spill conditions and limits are similar to those occurring in May of 1993 and 1994 then if maximum levels at Warrendale exceed 125%, the 12 hour maximum average would exceed 115%. The 115% average would restrict TDG prior to the 125% maximum.

Identify A Maximum TDG Cap of 120% for Warrendale: Assuming similar spill conditions as occurred in May 1993 and 1994, the 120% maximum is consistent with a 115% maximum 12 hour average TDG criteria. This criteria would be similar to that adopted by the Commission during 1994. In 1994 the 115%-120% TDG criteria were identified as a zero to slight increase in risk to mortality associated with TDG.

Justification for TDG criteria:

The USFWS provides no new substantive information to support the request to modify the TDG criteria. The information provided is a limited, and apparently selective, summary of the available data. The Department's review is not intended to provide a re-evaluation of information previously presented. The Commission is referred to past EQC staff reports and hearings for an understanding of the TDG issue. The limited response provided to the USFWS request provides a reminder of previous presentations.

The USFWS cites data from the NMFS collected in 1993 and 1994 suggesting that few signs of GBD (Gas Bubble Disease) are observed in resident aquatic life and migrating juvenile salmon at less than 120% TDG. However, despite repeated requests the NMFS has persistently refused the Department access to this data. Similarly, the Department has identified concerns with substantive changes in the draft data from these studies made available from the FPC and those reported in subsequent documents (Spill and 1995 Risk Management). The NMFS has refused to assist the Department in verification of the draft data associated with these reports. Because of the NMFS concerns with relying on the draft data, and the NMFS refusal to make drafts available to the Department, it is not reasonable to use this data to support this spill request.

The USFWS cites three documents, but provides no review of the documents, suggesting that "spill is by far the safest route of passage". The USFWS provides no discretion or review of the data, relying instead upon faith in their interpretation. However, previous reviews presented to the Commission suggest that spill provides a safer passage method as compared to turbine passage.

The USFWS cites a single document to suggest that chinook salmon under prolonged exposure will be safe from TDG levels up to 120%. The single citation is a remarkably limited evaluation of available literature. Previous review presented to the Commission suggest that for fish held in violation cages a threshold for substantial mortality occurs between 120-125% TDG.

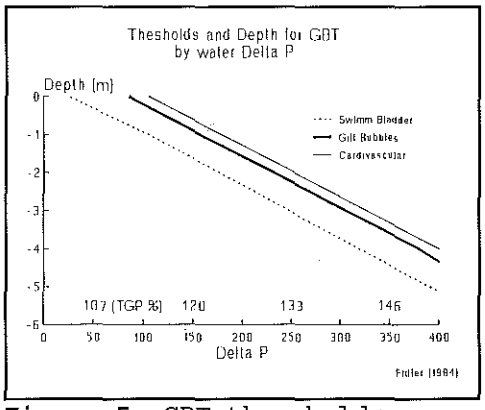
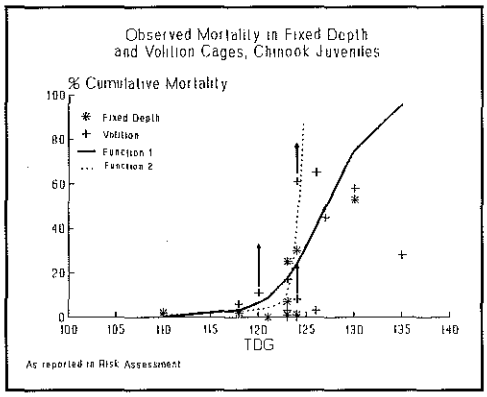


Figure 5, GBT thresholds



The relationship between TDG, depth, and signs of gas bubble disease is discussed by Fiddler (1984, 1989, in Fiddler 1993). Fiddler describes the importance of depth (hydrostatic) compensation on the symptoms associated with gas bubble trauma. The compensation depth is dependent upon the GBD symptom. Fiddler observes that over inflation of the swim bladder is a problem for small fish (< 35 grams in weight) and mortalities are generally chronic in nature. Shrimpton (1990, in Fiddler 1993) observed that small fish would respond to over inflation of the swim bladder by seeking deeper water. These studies demonstrate the means for compensating the effects of swim bladder over inflation, and thereby avoiding other potential symptoms of GBD. These studies found that as fish grew in size, there was less tendency to use depth of a means of compensating for TDG because the larger fish are able to vent gas and do not experience gas bladder over inflation. Fiddler (1993) suggests that two separate thresholds may exist for mortality due to TDG. The lower threshold corresponds to that at which the growth of extracorporeal interlamellar bubbles and sub-dermal emphysema of skin surfaces begins. The higher threshold corresponds to that at which bubbles form in the cardiovascular system.

The USFWS request suggests that the limited exposure time provides a mitigating factor in the analysis of risk from elevated levels of TDG. Although the USFWS provides no data to support their contention, the duration of exposure is an important component of the risk of mortality due to TDG.

Available field and laboratory studies provide information demonstrating the effect of exposure period on the mortality of both juvenile and adult salmon. In developing algorithms for the CRiSP model data, Anderson (1995) used juvenile salmonid mortality data from Dawley et al (1976) collected under varying levels of TDG in 2.5 meter tanks.

The cumulative mortality from multiple tests indicate that the mortality is greater at higher levels of TDG ($\geq$120%) as compared to relatively lower levels of TDG ($\leq$120). The data also support previously documented observations of a latent period of no, or low mortality prior to the onset of a relatively more rapid mortality rate. This data implies that the duration of the latent period, as estimated by the simple regression equation, may be dependent in part on the level of TDG.

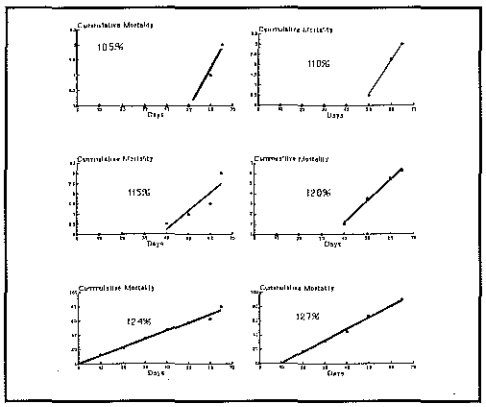


Figure 6, Juvenile Chinook cumulative mortality, From Dawley, 1976, fit to simple linear regression model

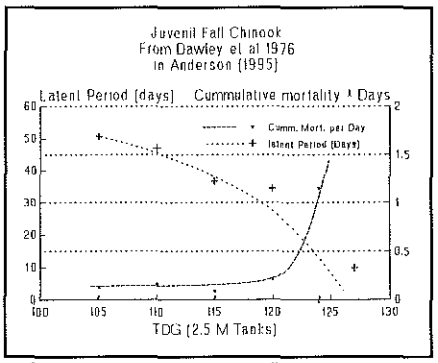


Figure 7 Calculated cumulative mortality rate (linear) in days and threshold period (days) vs TDG

The authors of CRiSP1.5 used a cumulative mortality function of

$$\frac{dS}{dt} = -M_n S$$

(Anderson 1995). This function appears to overestimate the observed mortality during the latent period of low mortality, and underestimate the observed cumulative mortality rate at higher levels of TDG and extended exposure. The simple linear rates were fit to only that data indicating measurable mortality.

The data available from Weitkamp (1976) collected from volition live cage experiments in the Columbia River also suggests that the risk of mortality from elevated levels of TDG are dependent upon time of exposure, the level of TDG, and the depth available to juvenile fish (previously presented).

The relatively short duration of exposure due to the limited 10-day spill period would reduce the risk of mortality under moderately elevated (115% TDG) levels of TDG.

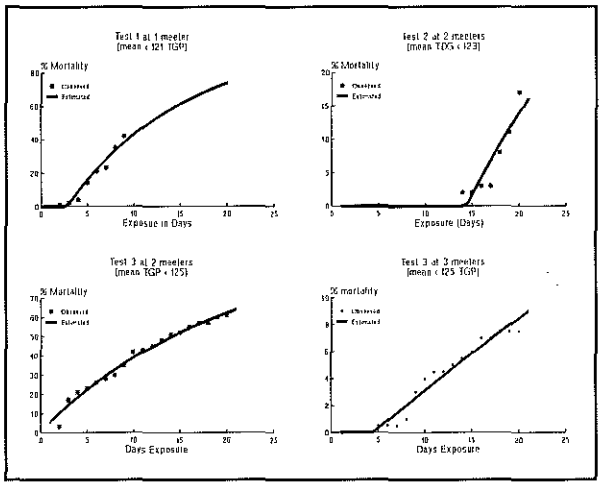


Figure 8 Cumulative Mortality from selected test conducted by Weitkamp (1976) in the Columbia River

In an unpublished manuscript to be presented at the 125th Annual Meeting of the American Fisheries Society, Bouck (1995) demonstrates that at 126% saturation, time to 5% mortality was near 5.6 hours for fingerling rainbow trout held at less than 30 centimeters.

Survival Calculations:

The USFWS state that they calculated a 5% increase in survival associated with a 115% TDG criteria as a result of increased percentage of fish passing via spill rather than turbines at Bonneville. The USFWS do not provide their calculations, base conditions or assumptions. Therefore the 5% increase in survival can not be verified.

The USFWS observes that the Spring Creek Hatchery Fish are not endangered.

The Spring Creek Hatchery Release makes up a large proportion of the US/Canada treaty production, and are important to local fisheries.

The USFWS cites the NMFS 1995 consultation and Biological Assessment as describing Bonneville Operations for the March release of Spring Creek fish. The NMFS has refused repeated requests from DEQ for copies of the Draft biological opinion. The citations cannot be independently verified.

Example Calculations:

Assumption: Spill Survival 98% (previous documents presented to EQC)

Assumption: Turbine Survival 87% Ledgerwood et al (1994)

Net survival = (FPE*0.98)*([1-FPE]*.87)

ΔSurvival(%) = 0.11*ΔFPE(%)

At 7,500,000 (USFWS) Juveniles = 8,250 Juv./ ΔFPE%

At 1.1% contribution as adults to fishery (USFWS) = 90.75 adults/ΔFPE%

Δ10% = 907 adults to fishery (see text) (1,073)
Δ20% = 1,815 adults to fishery
Δ30% = 2,722 adults to fishery
Δ30%* = 3,217 Adults to fishery (see text) (3,217)

At 5% (USFWS) increase in juveniles = 4,125 adults to fishery.

1Example Calculations

Example calculations provide a relative assessment of the potential increase in juvenile survival and contribution of adults to fisheries by changes in the percentage of the population going over a spillway (FPE) and assumed survival rates. Alternative survival rates could also be assumed, which in turn would affect the calculated benefit in survival and contribution to adult fisheries. Only one study is available (Ledgerwood 1992) that compares survival to the estuary for both turbine (83%) and spillway (96%) passage. Using these survival rates would increase the relative juvenile survival and contribution to adult fisheries due to incremental increase in FPE.

The USFWS did not present the FPE that would be achieved within the 110% TDG criteria. A memorandum from Russ George (Reservoir Control Center) to the Fish Passage Center dated 2/22/1995 discusses the SOR for Bonneville Dam. The memo describes that:

d) Spill and powerhouse operations will be managed to achieve 70% daily average FPE

e) Spill will be limited so as not to exceed applicable Oregon and Washington standards for total dissolved gas (currently 110% TDG) as measured at Warrendale Or. and Skamania Wa.

This information implies that the base condition for comparison is a FPE of 70%. The proposed additional spill to 115-120% TDG is needed to achieve a 10% increase to 80% FPE. As discussed above, a 10% increase in FPE is reasonably expected to increase survival of juveniles to the estuary, and adults to Canadian and local fisheries.

As described earlier in the example calculations, the estimated number of adults provided to the fishery (907 - 1,073) is largely dependent upon assumptions. The information may also be used to describe the dilemma faced by the Department when reviewing proposals that fail to describe how the conclusions were reached. By re-arranging the survival equation described and making the following assumptions:

Change in FPE from 70% to 80%
A survival rate of 100% for spill

The survival rate for turbine passage to achieve the 5% improved survival cited by USFWS can be calculated as 50%. A 50% mortality (110-Survival) through the turbines is much greater mortality than has been cited for Bonneville. It is apparent that the USFWS either assumed a much greater mortality than has typically been used for Bonneville, or assumed a much different base condition than implied in the memorandum of 70% FPE to achieve water quality standards.

Making the assumptions that the base conditions are described by:

A turbine survival of 85%
A spill survival of 98%
A target of 80% FPE

The base FPE can be calculated as 41.54% It appears that USFWS may have assumed base conditions much lower than indicated in the memo by Russ George describing operations at Bonneville designed to achieve existing WQS.

We are then left wondering what conditions the USFWS used as base conditions, what assumptions were made to determine relative increase in survival, and what relevance the 5% statistic cited by USFWS has.

Estimates of $500,000 to $1,500,000 additional cost associated with the spill beyond that contained in the SOR (assumed to be 70% FPE) (Russell Harding ODEQ via BPA) and an order of magnitude estimate of 1,000 adults provided to the fishery would result in a relative worth of $500 to $1500 per adult Chinook Salmon in fishery. It is not clear whether the cost estimates

reflect lost revenue to BPA, additional costs to the Direct Services Industries (DSIs), opportunity costs, or include any multiplier for economic effects. Alternatively, using the USFWS service estimate of 5% improved juvenile survival and 1.1% juvenile to adult recovery in the fishery would result in much lower estimate of $121 to $363 per fish in the fishery. However, since DEQ can not verify either the survival estimates, or the cost estimates, these figures are extremely subjective.

These calculations are, by necessity, simplifications of the actual methods by which juvenile fish could pass Bonneville. Instream migrants could pass Bonneville by one of five methods (Table 1). The second, newer turbine has substantially higher survival rates than the older turbines in "powerhouse 1". The fish bypass efficiency at Bonneville is limited, and fish passing via the bypass appear more prone to predation. Similarly, predation in the tailrace of Powerhouse 2 appears significant and a major component of total mortality to the estuary. During 1992, overall survival was greater to the estuary for juveniles that passed through turbine 1 as compared to turbine 2.

No data exists to determine how much the expected colder temperatures and higher flows in the spring would reduce mortality due to predation compared to the warmer summer low flows under which the studies were conducted. Therefore, it is not possible to determine if overall survival could be improved by passage through the newer "second turbine and tailrace" rather than through the "first turbine and tailrace". It is not possible to run all the water through the newer turbine. Operation constraints require that a portion of the total flow go through the older "first turbine and powerhouse".

Table I Bonneville Survival Studies

Reaches Studies	Turbine Survival	Relative Results	
		1987-90	1992
1st Powerhouse Turbine @ tailwater	85-89%		Higher (0.3464)
1st Powehouse bypass and tailwater			Lower (0.3061)
Spillway	98-100%	Higher	
2nd Powerhouse Turbine @ tailwater	97-98.5% 96-99%	Higher	Lower (0.3124)
2nd Powerhouse bypass @ tailwater		Lower	
Transport (experimental)			Highest (0.4272)

Survival of subyearling fall chinook has been studied at Bonneville during separate studies from 1987 to 1990 and during 1992. Studies indicate that mortality of fish passing a turbine differ depending on which powehouse fish go through. Results also indicate that to understand overall survival it is important to understand how the subsequent mortality occurs, assumed due in a large part to predation, in the different tailraces of the projects.

Past research on survival of juvenile salmonids through the turbines at the first powerhouse is cited as 85-95%, which is similar to studies at other projects with the same type of turbine (Holmes 1952 in Ledgerwood et al 1994). Recent studies conducted at Bonneville Dam Second powerhouse turbines suggested survival through these newer units in from 96 to 99% (97.0 - 98.5%) (various values in Ledgerwood et al 1994). Spill survival is likely better described in Ledgerwood et al (1990) and (1991); however due to the short response period available the Department was not able to obtain these documents. Past evaluations of TDG emergency rule modifications suggested survival of 98-100% for juvenile salmon passed by spill (1994 Biological Opinion NMFS).

Ledgerwood et al (1994) cites Ledgerwood et. al 1990, and 1991 to describe survival of summer migrant subyearling fall chinook (*O. tshawystscha*) as being lower when passed through the Second Powerhouse bypass system as compared to passing through the second powerhouse turbines or over the spillway.

Results from the 1992 studies (Ledgerwood et al. 1994) showed fish passing Bonneville by either the Second Powerhouse turbines **and tailrace** or the First Powerhouse Bypass had significantly lower recovery rates (survival) compared to fish passing the First Powerhouse and tailrace. Survival rates for passage by the Second Powerhouse Turbines and Tailrace or the First Powerhouse Bypass were not significantly different. Fish that were passed by truck and released downstream had greater survival than any other method for passage past Bonneville.

Even though the second powerhouse turbine should be expected to result in relatively greater survival than the first powerhouse turbine, overall survival to the estuary was less when fish passed through the second powerhouse turbine as compared to the first powerhouse turbine. Several factors appear to influence survival. Predation in the tailrace appears to be a major factor influencing survival. Ledgerwood et al (1994) also observe that the low water year, and high temperatures during the summer of 1992 may have resulted in a worst case scenario for survival past Bonneville.

The studies cited and presented by Ledgerwood (1994) occurred during summer low flow conditions. Survival estimates may not be directly compared to survival estimates for the early spring spill for the Spring Creek Hatchery. For example, Ledgerwood et al. (1994) cites Ledgerwood et al. (1991) that survival increased with increased tailwater surface elevations. Similarly, predation rates may be different at higher flow conditions.

Simply comparing mortality by spill to turbine passage may neglect a substantial proportion of the mortality in the tailrace which appears related to bypass method. However, estimates of the mortality in the tailraces associated with the passage method are not presented.

The selection of a survival percentage affects the calculation of relative improved survival. For example, a substantially lower calculation of the different survival by spill compared to turbine passage would occur in a 97% survival from turbines (Powerhouse 2) compared to 85% (Powerhouse 1).

Adult Salmonids:

The USFWS makes no mention of adult salmonids.

Adult Steelhead and Spring chinook will be expected to be in the early portions of their seasonal migrations and be present below Bonneville.

When confined to shallow water adults salmon are known to be suffer acute mortality at elevated levels to TDG. Acute conditions depend both on the length of exposure and the magnitude of the dissolved gas. Much more limited field bioassay data exist describing the response of adult salmon to elevated TDG as compared to juvenile salmon.

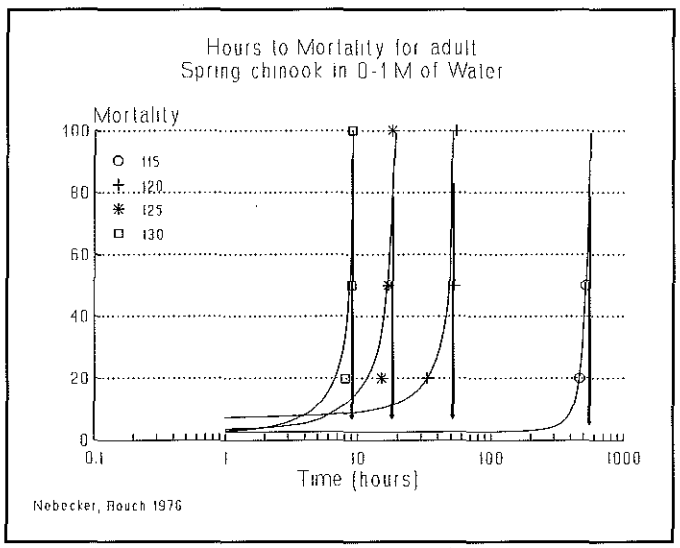
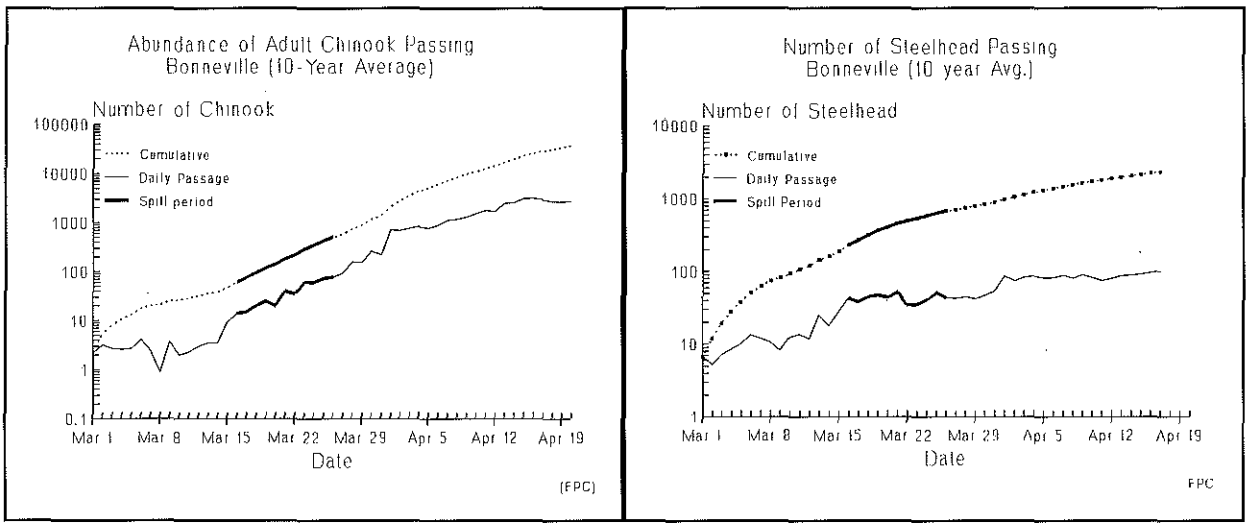


Figure 9 Mortality function used in review of Risk plan 1995

The attached figure illustrates data for adult mortality in one meter tanks as fit to single equation describing mortality as a function of exposure time and magnitude. The mortality rates can be compared to the duration of the proposed study. The depth distribution of adult salmon in the Columbia is not certain.

Previous modifications to the TDG of 115% with a 120% maximum were believed to provide no substantive risk to adult migrating salmon.



Supporting Material:

The USFWS cites the fisheries agencies and tribes Risk Assessment for the 1995 spill program. The Department has made lengthy and substantial comments on this document. Similar comments have been provided by consultants to the DSIs. The USFWS does not comment on or review these comments.

The fisheries agencies have undertaken an extensive effort to provide the Department a rationale for their understanding of Risks associated with TDG and the benefits of spill. The fisheries agencies have worked with DEQ and the State of Washington to understand, respond to, and incorporate comments, concerns, and criticism into the Risk Assessment. This exchange of information and understanding is a reasonable process. However, until it is complete, and the Departments comments are addressed, this document should not be used for supporting material.

Biological Monitoring:

No biological monitoring is proposed. Although there have been concerns with the interpretation of biological monitoring, no agency has yet suggested it is not warranted. The lack of a fail safe provided by biological monitoring, and lack of any ability to evaluate effects of spill, suggests greater caution is warranted than would be justifiable under a more rigorous biological monitoring effort.

Incidental Observations: Mortality of Caged Salmon, Willamette River

The Oregon Department of Fish and Wildlife had as much as 60-70% of juvenile chinook salmon contained in holding pens die due in part to levels of TDG exceeding 115%. The holding pens were 8 feet deep and maintained in the current of the lower Willamette River. The excess TDG levels appeared to be the result of extremely high flows over Willamette Falls.

Although the net pens were designed to be 8 feet deep, the bottoms of the nets were observed to be lifted by the high current. The fish in the net pens were likely restricted to depths of much less than 8 feet.

Many of the dead fish were observed to be descaled. The fish also observed to be struggling against the current and pushed back against the net. Descaling can lead to mortality through failure to maintain osmoregulation. The observed mortality is likely the result of several interacting factors, stress from struggling against the current, physical descaling from contact with the net, and gas bubble trauma.

History of events (Krebs, J. 1995)

Date	TDG	Observations
2/17		Fish put in pens. T=42F
2/18		Fish would not eat
2/19		T=48F
2/21	116%	Bubbles in opercle, caudle, anal and pelvic fins, occasional gill filament
2/22	Sportcraft 117 Net pens 114 Above Falls 100	Several fish descaled, pushed against net pens
2/24	110	Severe signs of GBD. Many moribund fish observed, probably died Tuesday-Wednesday, Moribund fish severely descaled
2/28	106	No more dying fish

The available literature suggests that exposure to TDG levels in the range of 115% to 120% may result in the appearance of GBD symptoms and mortality if fish are restricted to shallow water.

Literature reviewed by Jensen et al, (1986) suggests that fish held for an exposure of greater than 3 days (72 hours) at depths of less than 3 feet (1 meter) may face acute (LC_{50}) conditions at TDG levels of 115-120%.

The laboratory studies have been criticized because of the difficulty in interpreting the results of studies restricted to shallow depths of less than 1 meter to the mortality rates that could occur in river where fish have much greater depth available for hydrostatic compensation. Although not measured, the ODFW observations suggest fish may have been restricted to relatively shallow depth in the cages.

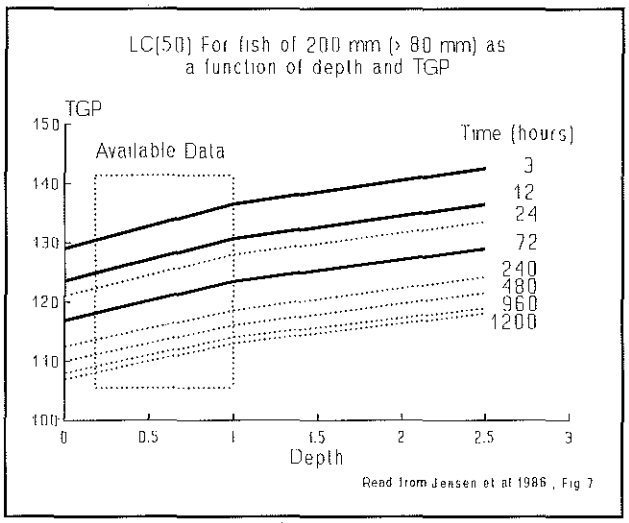


Figure 12 Acute (LC_{50}) response by TDG and Duration, Dose Response Model

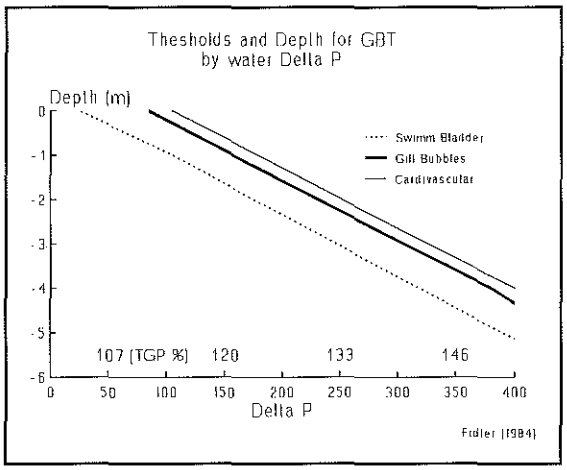


Figure 13, GBT thresholds

Similarly, data discussed by Fiddler (1984, 1998, in Fiddler 1993) suggests that GBD symptoms would be expected in fish restricted to shallow depths with TDG levels in the range of 115-120%. This data describes the importance of depth (hydrostatic) compensation on the symptoms associated with gas bubble trauma. The compensation depth is dependent upon the GBT symptom. Fiddler observes that over inflation of the swim bladder is a problem for small fish (< 35 grams in weight) and mortalities are generally chronic in nature.

Fiddler (1993) suggests that two separate thresholds may exist for mortality due to TDG. the lower threshold corresponds to that at which the growth of extracorporeal interlamellar bubbles and sub-dermal emphysema of skin surfaces begins. The higher threshold correspond to that at which bubble form in the cardiovascular system begins.

The observations of Gas Bubble Trauma demonstrates that fish were under additional stress from elevated levels of GBD. Mortality, however, may not have been solely due to TDG. Additional stress from fighting the current and descaling from contact with the nets are also probable factors leading to the observed mortality.

Summary of Public Comment

Public comment was received from the following groups:

1. Crystal Springs
2. EPA, Seattle
3. Environmental Resources Division of the North Pacific Division of the U.S. Army Corps of Engineers
4. Oregon Department of Fish and Wildlife
5. Columbia River Inter-Tribal Fish Commission
6. Northwest Environmental Defense Center
7. Direct Service Industries and Pacific Northwest Generating Cooperative
8. Applied Sciences Inc.

Support for the USF&W Petition

Support for the petition came from the first six parties listed above.

Crystal Springs support the petition based on the scientific credibility of the Fish Passage Center, and recommend that the Commission permanently raise its TDG standard for the Columbia River to assist migrating salmon.

Jack Gakstatter of EPA, Seattle contacted Russell Harding by phone on March 14, 1995 and said that EPA supports whatever recommendations are made by the fisheries agencies to assist salmon migration.

The Corps of Engineers summarized its operational requirements for the spill including details of dates, times and flow. The Corps confirm that it will operate the dam within existing Oregon and Washington gas saturation criteria unless it is modified by the EQC and the cognizant Washington agency.

The Oregon Department of Fish and Wildlife (ODFW) supports the spill at the high dissolved gas level to increase the survival rate of the Spring Creek Hatchery salmon. The agency sees survival of these fish as being important as the estimated 82,500 adult contribution from this run constitutes a large proportion of the U.S./Canada treaty stock. ODFW also states the harvest of these fish will protect endangered Snake river fall Chinook.

The Columbia River Inter-Tribal Fish Commission (CRITFC) strongly support the proposed spill. It believes the improved survival of smolt will provide additional treaty harvest for the tribes and protect the additional take of Snake River Chinook salmon in the mixed-stock ocean fishery.

The Northwest Environmental Defense Center supports increased gas saturation for migrating salmon. The Center claims that in-stream migration with increased gas saturation is vastly superior to other forms of salmon transportation.

Oppose the Petition

The Direct Service Industries (DSI) and Pacific Northwest Generating Cooperative (PNGC) recommend the Commission reject the USFW petition. They argue that increasing the dissolved gas saturation in the Columbia River poses an unacceptable risk to aquatic life. At the same time the increased spill is a direct subsidy to commercial harvest interests.

The comments include four major headings:

I. The Process is Too Hasty to Provide Meaningful Information to Assist EQC in Evaluating the Spill Proposal.

DSI and PNGC argue that the short period of notice of this proposal does not allow for adequate public input or reasoned evaluation of the proposal. The parties request to be heard orally at the EQC meeting on Wednesday, March 15, 1995 in the event the Commission wishes to hear from representatives of the fisheries agencies.

II. Spending $556 Per Hatchery Fish is Not a Reasonable Balancing of Beneficial Uses of the Columbia River.

The most sensible means of getting hatchery smolt to sea is through transportation in net pens. One of the most substantial criticism of barging is that the returning adults stray upon return. DSI/PNGC argue that if the point of this exercise is harvest, then it doesn't matter if the fish do not all return to the point of origin.

DSI/PNGC estimate the increased number of fish available for harvest at 825 and claims that the USFW estimate of 4,125 is relative to no spill. Instead, they argue the 80 percent survival with the increased gas saturation standard should be compared to 70 percent survival with spill within the existing 110 percent level. DSI/PNGC estimate the cost of the spill at $1.5 million or $556 per fish.

III. The Recommendation Does Not Provide a Reasonable Balance of Risks to the Biological Communities of the Columbia River.

DSI/PNGC argue that there is little scientific evidence of the virtues of out-mitgration by spill at Bonneville versus passage through the turbines. Mortality through the second powerhouse is much lower.

A recent incident in the Willamette River saw substantial numbers of juvenile salmon killed at 114-117 percent dissolved gas. Salmon were being held in 8 foot deep net pens.

They argue that any benefit of improved survival will be dissipated through mortality as a result of higher gas levels.

IV. There Will Be Inadequate Monitoring to Determine the effects of the Supersaturated Water.

There will be no biological monitoring. DSI/PNGC recommend that the Commission insist on a solid scientific foundation for varying the existing 110 percent standard.

Applied Science, Inc. (Larry E. Fiddler) believes the USFWS petition is flawed, and ignores much information currently available in the scientific literature and the loss of many juvenile salmon in the Willamette River to Gas Bubble Trauma (GBT) recently.

Fiddler argues that whereas USFWS claims no visual signs of GBD were observed at TDG levels exceeding 120 percent, that GBT is not visually detectable. He produces evidence to show that microscopic examinations are required.

Fiddler notes the USFWS claim that fish will not be exposed to supersaturated water for long periods. He claims that 50 percent mortality occurred at gas saturation levels of 115 percent between 50 and 700 hours.

Fiddler does not support the USFWS claim that fish can compensate for elevated gas levels by "sounding" to greater depths. He cites experimental evidence supporting the contention that fish mortality is significant at 115 percent TDG despite having eight feet of water depth available to them.

Fiddler notes that there is no biological monitoring proposed in the USFWS request as required by the TDG rule.

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

In the matter of the US Fish	(	ORDER
and Wildlife Service request	(	
to spill water to assist	(	
out-migrating Spring Creek	(	
hatchery smolts	(	

WHEREAS the Department of Environmental Quality received a request from US Fish & Wildlife Service (USFWS) on March 7, 1995, to adjust the Total Dissolved Gas (TDG) standard as necessary to spill over Bonneville Dam for 10 days, commencing on March 17, 1995, to assist out-migrating Spring Creek hatchery salmon smolts; and

WHEREAS the USFWS submitted its justification for the spill on March 9, 1995; and

WHEREAS the public was notified of the request on March 7, 1995 and given the opportunity to submit written comments until noon on March 14, 1995; and

WHEREAS the Environmental Quality Commission (EQC) met on March 15, 1995 and considered the request, justification, and all public comment:

THEREFORE the EQC orders as follows:

1. The Commission found that:

   a) its failure to approve the petition would not result in significantly greater harm to salmonid stock survival through in-river migration than would occur by increased spill;

   b) that the modified total dissolved gas criteria associated with the increased spill does not provide a reasonable balance of the risk of impairment due to elevated total dissolved gas to both resident and migrating adult and juvenile salmonid when compared to other options for in-river migration of salmon;

   c) adequate data does exist to determine compliance with the standard; and

   d) no biological monitoring was proposed to document that the migratory salmonid and resident biological communities are being protected.

2. The Commission does not approve a modification to the TDG standard for spill over the Bonneville Dam for Spring Creek hatchery salmon.

Dated: 3/17/95

ON BEHALF OF THE COMMISSION

Lydia Taylor, Interim Director

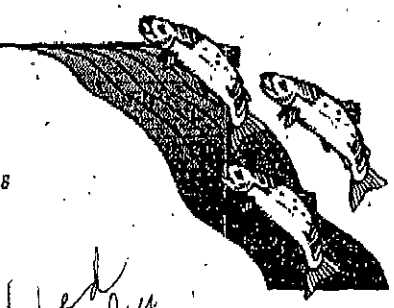
SA\WC13\WC13325.5

Save Our Wild Salmon • Coalition •

Save Our Wild Salmon Coalition Offices:

Main Office: 1516 Melrose Avenue, Suite 200 Seattle, Washington 98122
(206) 622-2904 / (206) 622-2924 *fax*

Field Offices: 1511 North Eleventh Boise, Idaho 83702 / (208) 345-9067
921 Southwest Morrison, Suite 432 Portland, Oregon 97205 / (506) 497-0188



Faxed Yesterday 3-14-95

RECEIVED
MAR 15 1995
Water Quality Division
Dept. of Environmental Quality

March 14, 1995

Environmental Quality Commission
c/o Water Quality Division
811 SW 6th Ave.
Portland, OR 97204

via fax 229-6124

Dear Commissioners:

I wish to comment briefly on the variation of Columbia River Total Dissolved Gas Standard requested by the US Fish and Wildlife Service for a 10 day period beginning 3/16/94.

The Save Our Wild Salmon Coalition advocates spilling water over the dams as the safest method of passing juvenile fish downstream. Even though an increase in total dissolved gas in the river may produce a slight increase in incidents of gas bubble disease in smolts, the mortality rate when spill is used as a passage method is far lower than the mortality rate when the smolts are forced to go through the turbines.

The Agencies' and Tribes' spill and 1995 risk assessment very carefully analyzes the mortality rates associated with spill and for other passage methods and concludes that spilling water is less lethal to the fish than any other passage method.

We support this request for a variation and urge you to look at the overall mortality rates of fish that were spilled and compare them to the mortality rates of fish that were pulled through the turbines.

Sincerely,

Marcia L. Anderson

COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION
729 N.E. Oregon, Suite 200, Portland, Oregon 97232
Telephone (503) 238-0667
Fax (503) 235-4228

March 14, 1995

Lydia Taylor, Acting Director
Oregon Department of Environmental Quality
811 SW Sixth Avenue
Portland, Oregon 97204

FAXED TO YOU 3/14/95

Dear Ms. Taylor:

The Columbia Inter-Tribal Fish Commission (CRITFC), a technical service organization for the Confederated Tribes of the Umatilla Indian Reservation, the Yakama Indian Nation, the Nez Perce Tribe and the Confederated Tribes of the Warm Springs Reservation of Oregon submits the following comments with respect to the March 7, 1995 proposed variation to the Total Dissolved Gas Standard for the state of Oregon by the United States Fish and Wildlife Service (USFWS). The proposed variation has important implications for the protection of our member tribes' treaty resources.

General Comments

The total dissolved gas level caps presented in the USFWS proposed variation are likely too conservative and will likely not protect the entirety of the migration of 7.5 million juvenile tule fall chinook as they pass through the Bonneville hydroproject. However, CRITFC supports the proposed variation because the alternative of retaining a 110% total gas pressure (TGP) standard would severely restrict if not eliminate controlled spill, result in a loss of thousands of adult fish for future in-river treaty harvest, and possibly cause additional take of listed Snake River adult fall chinook in the mixed-stock ocean fishery which could further threaten in-river treaty harvest.

CRITFC strongly recommends the Oregon Department of Environmental Quality adopt the USFWS proposed variation and allow for renewal of the 48 hour emergency clause to cover the entire passage period for outmigrating Spring Creek juvenile salmon. This period is defined by the fishery agencies and tribes as March 17-March 26, 1995.

For the record, CRITFC supports the total dissolved gas levels justified in the fishery agencies and tribes, scientific document entitled, "Spill and 1995 Risk Assessment". In this document a range of 120-125% TGP as measured at a downstream dam's forebay was considered conservative when compared to the risk of turbine passage. In the case of Bonneville Dam, this would equate to a measurement of an average measurement of 120-125% as measured at the Camas/Washougal monitoring station.

Specific Comments

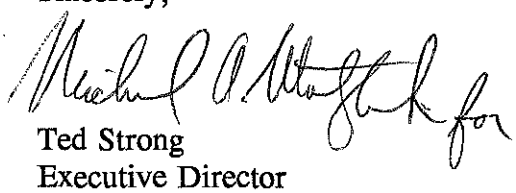
The poor condition and poor guidance efficiency of juvenile mechanical bypass systems at both Bonneville powerhouses leaves controlled spill as the only alternative to protect juvenile fall chinook from turbine passage. Direct mortality for subyearling fall chinook passing through turbines has been estimated at 15% at powerhouse I (Holmes 1952), and 18% at powerhouse II (Giorgi and Stuehrenberg 1987). Although indirect mortality from turbine passage has not been measured at either powerhouse, studies which examined indirect mortality of juvenile salmon from turbine passage have indicated that internal gross and microscopic muscle and brain lesions and scale loss from turbine passage would likely result in substantial delay mortality (Kostecki et al. 1987).

CRITFC recommends Bonneville Dam operational conditions to protect outmigrating Spring Creek juvenile fall chinook as outlined by System Operational Request # 95-2 issued February 3, 1995 to the Corps of Engineers by the Fish Passage Center, with one exception. Because Spring Creek juvenile fall chinook do not exhibit a pronounced diel migration, and as few if any anadromous adult salmon will be passing through the Bonneville Dam adult fishways (Corps of Engineers 1991-1993) during passage of the Spring Creek juvenile salmon, the daytime spill cap for adult passage should be raised to 100 kcfs. These operational measures would insure the best means to achieve a minimum 80% fish passage efficiency goal, and insure the best opportunity to maximize adult returns in the future.

From a passage perspective, maximizing adult tule returns will also minimize the possibility that the adult trap at the powerhouse II fishway would have to be utilized to capture returning adult tules for broodstock, because enough adult returns would ensure adequate broodstock would be available back to the hatchery. Operation of the adult trap combined with dam operation to maximize efficiency of the trap not only causes delay to listed Snake River adult fall chinook, and other adult fall chinook and steelhead, but also requires reduction of spill and operation of powerhouse II which increases dam mortality for listed and unlisted subyearling fall chinook.

In conclusion, CRITFC strongly recommends the Oregon Department of Environmental Quality approve the USFWS proposal for an emergency variance to the existing TDP standard of 110% and allow extension of the 48 hour emergency rule to cover the entirety of the Spring Creek Hatchery juvenile tule migration from March 17 - March 26, 1995. Should you have questions concerning these recommendations please contact Bob Heinith at (503) 731-1289.

Sincerely,



Ted Strong
Executive Director

spcr.5a

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Oregon

March 13, 1995

DEPARTMENT OF
FISH AND
WILDLIFE

OFFICE OF THE
DIRECTOR

Lydia R. Taylor
Acting Director
Department of Environmental Quality
Water Quality Division
811 S.W. Sixth Avenue
Portland, OR 97204

Re: Comments on Proposed Variation of Columbia River Total Dissolved Gas Standard

Dear Lydia:

The Oregon Department of Fish and Wildlife (ODFW) supports the proposal by the U.S. Fish and Wildlife Service to modify total dissolved gas (TDG) criteria in the Columbia River downstream of Bonneville Dam to allow 115% (average of 12 highest hours) TDG at the Camas-Washougal monitoring site and a maximum 125% tailrace TDG from March 17 through March 26. This modification will allow spill at Bonneville Dam to provide up to 80% fish passage efficiency, increasing the survival of 7.5 million juvenile tule fall chinook salmon scheduled for release from Spring Creek National Fish Hatchery on March 16, 1995.

Protection of these fish is extremely important since the 82,500 adult contribution from this release constitutes a large proportion of the US/Canada treaty production and helps limit harvest on ESA listed Snake River fall chinook in Canadian fisheries. Tule fall chinook from Spring Creek NFH also are a strong contributor to northern Oregon ocean sport and commercial fisheries, Buoy 10 sport fisheries, lower Columbia River gillnet fisheries, and Treaty Indian fisheries in the Bonneville pool.

This proposed Bonneville spill operation will significantly improve the survival of Spring Creek Hatchery fall chinook by reducing turbine mortality. The U.S. Fish and Wildlife Service and National Marine Fisheries Service estimate the proposed spill operation will improve survival by 5% through reduced turbine mortality at Bonneville's First Powerhouse and not operating Bonneville's Second Powerhouse. The proposed TDG variance will pose little risk to migrating juvenile and adult salmonids and resident fish according to information provided in the report "Spill and 1995 Risk Management", developed by the Oregon Department of Fish and Wildlife, Washington Department of Fish and Wildlife,

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Idaho Department of Fish and Game, and Columbia River Inter-tribal Fish Commission submitted to the state water quality agencies earlier this year. This finding is corroborated by biological monitoring results collected below Bonneville in 1993 and 1994.

We urge the support of the Environmental Quality Commission, and yourself in considering this TDG variance request critical to spill programs described above, and look forward to working with you in 1995.

Sincerely,

RUDOLPH A. ROSEN (for)
Director

c: Mike Spears (USFWS)
Will Stelle (NMFS)
Mary Riveland (WDOE)
Donaldson (CBFWA LG/FPAC distn)

OREGON DEPARTMENT OF FISH AND WILDLIFE

2501 S.W. First Avenue, P.O. Box 59, Portland, OR 97207

FISH DIVISION FAX TRANSMITTAL

To: Company/Location	Fax #
LYDIA R. TAYLOR, DEQ - WATER QUALITY DIVISION	229-5850

From: RUDOLPH A. ROSEN Phone #: x. 401

Date: 03-14-95 Time: 11:14 Fax #: (503) 229-5602

Pages To Follow: 2 Verify #: (503) 229-5410, Ext. 323

Comments/Instructions:

	Please circulate		Take necessary action		Prepare reply
	For your information		Please investigate		As you requested
	For your signature		For your comments		Initial and return
	Edit and return		Call me		Original to follow

COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION
729 N.E. Oregon, Suite 200, Portland, Oregon 97232
Telephone (503) 238-0667
Fax (503) 235-4228

March 14, 1995

Lydia Taylor, Acting Director
Oregon Department of Environmental Quality
811 SW Sixth Avenue
Portland, Oregon 97204

Dear Ms. Taylor:

The Columbia Inter-Tribal Fish Commission (CRITFC), a technical service organization for the Confederated Tribes of the Umatilla Indian Reservation, the Yakama Indian Nation, the Nez Perce Tribe and the Confederated Tribes of the Warm Springs Reservation of Oregon submits the following comments with respect to the March 7, 1995 proposed variation to the Total Dissolved Gas Standard for the state of Oregon by the United States Fish and Wildlife Service (USFWS). The proposed variation has important implications for the protection of our member tribes' treaty resources.

General Comments

The total dissolved gas level caps presented in the USFWS proposed variation are likely too conservative and will likely not protect the entirety of the migration of 7.5 million juvenile tule fall chinook as they pass through the Bonneville hydroproject. However, CRITFC supports the proposed variation because the alternative of retaining a 110% total gas pressure (TGP) standard would severely restrict if not eliminate controlled spill, result in a loss of thousands of adult fish for future in-river treaty harvest, and possibly cause additional take of listed Snake River adult fall chinook in the mixed-stock ocean fishery which could further threaten in-river treaty harvest.

CRITFC strongly recommends the Oregon Department of Environmental Quality adopt the USFWS proposed variation and allow for renewal of the 48 hour emergency clause to cover the entire passage period for outmigrating Spring Creek juvenile salmon. This period is defined by the fishery agencies and tribes as March 17-March 26, 1995.

For the record, CRITFC supports the total dissolved gas levels justified in the fishery agencies and tribes, scientific document entitled, "Spill and 1995 Risk Assessment". In this document a range of 120-125% TGP as measured at a downstream dam's forebay was considered conservative when compared to the risk of turbine passage. In the case of Bonneville Dam, this would equate to a measurement of an average measurement of 120-125% as measured at the Camas/Washougal monitoring station.

Specific Comments

The poor condition and poor guidance efficiency of juvenile mechanical bypass systems at both Bonneville powerhouses leaves controlled spill as the only alternative to protect juvenile fall chinook from turbine passage. Direct mortality for subyearling fall chinook passing through turbines has been estimated at 15% at powerhouse I (Holmes 1952), and 18% at powerhouse II (Giorgi and Stuehrenberg 1987). Although indirect mortality from turbine passage has not been measured at either powerhouse, studies which examined indirect mortality of juvenile salmon from turbine passage have indicated that internal gross and microscopic muscle and brain lesions and scale loss from turbine passage would likely result in substantial delay mortality (Kostecki et al. 1987).

CRITFC recommends Bonneville Dam operational conditions to protect outmigrating Spring Creek juvenile fall chinook as outlined by System Operational Request # 95-2 issued February 3, 1995 to the Corps of Engineers by the Fish Passage Center, with one exception. Because Spring Creek juvenile fall chinook do not exhibit a pronounced diel migration, and as few if any anadromous adult salmon will be passing through the Bonneville Dam adult fishways (Corps of Engineers 1991-1993) during passage of the Spring Creek juvenile salmon, the daytime spill cap for adult passage should be raised to 100 kcfs. These operational measures would insure the best means to achieve a minimum 80% fish passage efficiency goal, and insure the best opportunity to maximize adult returns in the future.

From a passage perspective, maximizing adult tule returns will also minimize the possibility that the adult trap at the powerhouse II fishway would have to be utilized to capture returning adult tules for broodstock, because enough adult returns would ensure adequate broodstock would be available back to the hatchery. Operation of the adult trap combined with dam operation to maximize efficiency of the trap not only causes delay to listed Snake River adult fall chinook, and other adult fall chinook and steelhead, but also requires reduction of spill and operation of powerhouse II which increases dam mortality for listed and unlisted subyearling fall chinook.

In conclusion, CRITFC strongly recommends the Oregon Department of Environmental Quality approve the USFWS proposal for an emergency variance to the existing TDP standard of 110% and allow extension of the 48 hour emergency rule to cover the entirety of the Spring Creek Hatchery juvenile tule migration from March 17 - March 26, 1995. Should you have questions concerning these recommendations please contact Bob Heinith at (503) 731-1289.

Sincerely,

Ted Strong
Executive Director

spcr.5a

References

Columbia Basin Fishery Agencies and Tribes. 1995. Spill and 1995 Risk Assessment. Submitted to the Oregon Department of Environmental Quality and the Washington Department of Ecology. Fish Passage Center. Portland, Oregon.

Corps of Engineers. 1991-1993. Annual Fish Passage Reports. Columbia and Snake River Projects. Portland and Walla Walla Districts. Portland, Oregon.

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Holmes, H.B. 1952. Loss of salmon fingerlings in passing Bonneville dam as determined from marking experiments. Unpublished manuscript. United States Fish and Wildlife Service. Portland, Oregon.

Kostecki, P.T., P. Clifford, S.P. Gloss and J.C.Carlisle. 1987. Scale loss and survival of smolts of Atlantic salmon (Salmo salar) after turbine passage. Canadian Journal of Fisheries and Aquatic Sciences. Volume 44. Pages 210-214.

Northwest Environmental Defense Center
10015 S.W. Terwilliger Blvd., Portland, Oregon 97219
(503) 768-6673 Fax - (503) 768-6671

March 14, 1995

Oregon Department of
Environmental Quality

VIA FAX

Re: *Comments on Proposed Variation for Total Dissolved Gas Standard in Columbia River*

To Whom It May Concern:

NEDC has been among the leaders of efforts to protect salmonids in the Columbia Basin. The organization also has a long history of enforcing water quality standards.

We strongly support the proposed variance in the Total Dissolved Gas standard for the Columbia River. Well respected and experienced scientists with federal, state, and tribal fishery agencies have demonstrated both that juvenile passage via spill is vastly superior to passage via the powerhouse or via transportation, and that gas levels significantly higher than the existing water quality standard do not have adverse impacts on migrating juvenile salmon. Until reconfiguration of the dams reduces current mortality associated with passage, spill must serve as a primary means of getting juvenile salmon safely past the dams.

DEQ will undoubtedly be barraged with self-righteous comments from utilities and DSIs arguing that dissolved gas levels higher than the existing standards will harm salmon. These entities are much more concerned about their pocketbooks than migrating juvenile salmon,a nd are using this water quality issue as a surrogate for their opposition to measures to benefit salmon. Their reams of "scientific" information represents the best science money can buy, not independent research from a neutral party. Its credibility should be assessed accordingly.

In sum, NEDC strongly urges the Commission to raise the allowable dissolved gas level for the Columbia River, both for the action requested by the FWS and permanently.

Sincerely,

Daniel J. Rohlf
Board Member

DJR:lmm

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JACOB TANZER
OF COUNSEL

March 14, 1995

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Mr. Henry Lorenzen
c/o Corey, Byler, Rew et al.
222 S.E. Dorion
Pendleton, OR 97801

Re: March 15, 1995 EQC Conference Call Concerning Total Dissolved Gas Rule

Dear Chairman Wessinger and Commissioners:

We understand that representatives of the U.S. Fish and Wildlife Service may be permitted to address the Commission during its deliberations on its request. We therefore request an opportunity to participate in that conference call, and will make two leading experts on gas bubble disease available to respond to Commission inquiries during the call.

The DEQ staff advised us this afternoon that they are not inclined to permit our experts, who reside in Seattle and British Columbia, to participate in the call by phone. We cannot get the experts to Portland by tomorrow afternoon. If the Commission is willing to entertain oral input from Service representatives, who had it within their power to make this proposal months ago instead of waiting until the last minute, then the Commission should direct DEQ staff to extend the courtesy of a telephone link-up so that our experts can respond. Simple fairness requires no less. Informed decision-making also requires no less. We are willing to reimburse DEQ for the expense of adding our experts to the call. Otherwise, the Commission should entertain no input from interested parties, and rely upon the written submissions.

Enclosed is a copy of the Comments of the Direct Service Industries and Pacific Northwest Generating Cooperative on the Service's request. We have transmitted these

Comments because when filtered, digested and abstracted by a hearing officer, they will -- no matter how adequate the abstraction -- lose their impact. The recent fish kill in the Willamette River, which resulted from total dissolved gas levels far below those now sought by the Service, underscores the vital importance of careful Commission scrutiny of all relevant scientific evidence. That evidence does not support the request.

Yours very truly,

Jacob Tanzer
Attorney for the DSIs

(by JTT)
R. Erick Johnson
Attorney for PNGC

Copies to: Lydia Taylor
Robert P. Baumgartner
Russell Harding

Oregon

DEPARTMENT OF
ENVIRONMENTAL
QUALITY

March 8, 1995

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Ted Strong, Executive Director
Columbia River Inter-Tribal
Fish Commission
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Re: Notice to Fisheries and Hydro Power Agencies;
Requests for Modification of Total Dissolved Gas
for the Columbia River Spill Program

The Environmental Quality Commission (EQC) recently adopted administrative rules allowing the EQC to modify the Total Dissolved Gas (TDG) criteria for the mainstem of the Columbia River to facilitate juvenile salmonid migration through increased spill at Columbia River hydro projects. The Department of Environmental Quality (DEQ) expects to receive written petitions from the authorized fisheries and hydro power agencies asking the EQC to modify the TDG criteria to allow spill. This letter is intended to outline the process, timing and documentation necessary for the DEQ and EQC to act on any petition submitted under the new TDG rules.

Petitioners are expected to apply their professional judgment in presenting and reviewing adequate information to support the findings prescribed by the rule. The more specific and focused the petition, the less likely it becomes that new or additional information will be necessary. The general timing, public comment and petition contents are outlined below.

811 SW Sixth Avenue
Portland, OR 97204-1390
(503) 229-5696
TDD (503) 229-6993
DEQ-1

- **Timing of Petition:** Parties with authority to request and implement spill programs are expected to submit petitions to the DEQ. The DEQ reasonably expects a ***minimum of 45 days*** to evaluate the petition, receive and evaluate public comment and act on the petition. A shorter time frame might be considered for good cause if adequate information is provided.

- **Public Comment:** Under the rules, the DEQ must provide reasonable notice to interested persons and provide a comment period. This will generally need to be 15-to-30 days following notice. The Director may, however, modify the TDG criteria for emergencies for a period not exceeding 48 hours.

- **Petition Contents:** DEQ staff will evaluate the merits of the petition and prepare a report for the EQC. Petitioners should anticipate significant public and scientific review. Since the DEQ expects to provide only one public review period, the petitioner(s) may not have an opportunity to respond to comments received during the public comment period. Therefore, the DEQ encourages petitioners to fully explore the debate, anticipate opposing arguments and respond to them in advance. The petition must include adequate data and information for DEQ evaluation and EQC findings. A description of appropriate petition contents is attached (see Attachment A).

The DEQ recognizes the importance of TDG criteria modification requests to the management of the Columbia River hydro system. Adequate notice to the DEQ, complete documentation and sufficient data justifying EQC findings and action are critical to the success of any petition. DEQ staff are available to clarify any of the points discussed herein. Thank you for your attention to this important issue.

Sincerely,

Lydia Taylor
Interim Director

CR/ko
Attachment
cc + attachment: Environmental Quality Commission
Water Quality Division, DEQ
Michael Huston, Attorney General's Office
Bill Sobolewski, U. S. Environmental Protection Agency,
Oregon Operations Office

ATTACHMENT A

State of Oregon
Department of Environmental Quality

Total Dissolved Gas (Criteria Modification) Petition Contents

The Department of Environmental Quality (DEQ) expects a complete petition to contain the following documentation, data and analysis:

1. Definition of agency requesting modification.

The agency(ies) management responsibilities should be defined, their role in protecting the aquatic resources of the Columbia River described and their ability to implement their proposed request should be explicitly defined.

2. Proposed Total Dissolved Gas (TDG) criterion.

The language for the proposed criterion should be explicitly defined. Any anticipated temporal or spatial variations in the application of the criterion should be incorporated into the proposed language.

3. Location and timing for application of proposed criterion.

The applicable reaches for the TDG criterion should be defined in detail at least as consistent as current Oregon Administrative Rules (OARs).

The starting date and time, and ending date and time for the application of the proposed criteria should be defined. The period of application should recognize that the criteria reverts back to existing levels following an approved spill program.

Resources that will be potentially impacted by the TDG should be described. For example, all stocks of fish known or suspected to migrate during the period of application coincident with the location of application should be described (i.e., shad, salmon, sturgeon). The Oregon Department of Fish and Wildlife (ODFW) would provide a reasonable source of available information. Similarly, the resident aquatic resources within the bounds of the modified criterion should be described.

4. Statement of need for the proposed criterion.

The statement of need should describe the overall objectives of the proposal, ecological benefits derived and why this could not be achieved under current criteria.

5. Rationale for the derivation of the proposed criteria.

The rationale is expected to provide the scientific justification for the proposed criterion levels. At a minimum, the rationale is expected to contain a review of available literature that presents data and information necessary to meet findings, (i) through (iv) of the rule. The review should contrast its criteria against those contained in any existing or draft National Marine Fisheries Service (NMFS) biological opinions for the Columbia River. The rationale is anticipated to contrast existing conditions against available options and to contrast the available options for salmonid migration such as transportation via barge.

It is not necessary to repeat documents already available. If one or more documents have been published and principally relied upon in the development of criteria, they may be submitted. The rationale would be expected to summarize the submitted documents and provide guidance for the reviewer. Only the principal documents relied upon need be submitted; it is not necessary to submit all literature cited.

The DEQ and public reviewers should not be assumed to be familiar with available data and literature. Any statements of findings based on cited literature should incorporate and present the original data either graphically or in tabular form.

The rationale is expected to present the calculations for relative benefits (or mortality) such that the calculations can be verified. Where literature value are used for calculating relative mortality, the literature should be appropriately cited. Where non-peer reviewed literature or raw data are used, the citations should include where and how to obtain the data. If numerical models are used to estimate relative mortality (or benefits) then model documentation describing theory, algorithms employed and calibration should be submitted. Although it is not necessary to submit executable versions of the model or model code, the DEQ may request these as part of the review. The DEQ will assume the models submitted are public domain unless otherwise informed.

6. Documentation of findings (i) through (iv).

These sections will draw from the information presented above. For each of the findings (i) through (iv), a specific finding should be stated, summarizing the scientific rationale for the conclusion and leading the reviewer to the reasons for the findings as presented above. For example, under ***(i) failure to act would result in greater harm to salmonid stock survival through in-river migration than would occur by increased spill,*** there should be a finding that is similar to:

...Failure to adopt the proposed TDG criteria will result in greater harm to salmon survival because more fish would pass through turbines suffering greater mortality as calculated in section 5 part xx above.

Other options for passage would prove less effective because of the concerns described in section 5 part xx above.

These findings are the focus of the review, and the Environmental Quality Commission (EQC) must agree with them to implement the rule. Therefore, the findings should be explicit.

7. Supporting material.

The proposal is anticipated to contain all supporting material necessary to make a reasonable conclusion. It is not necessary to supply all cited literature but literature principally relied upon should be submitted. The applicant will be expected to make all documents available for public request; the DEQ ***will not*** copy and make information available. The DEQ will cite information received and the submitting agency.

8. Description of physical monitoring of TDG.

This description should include who will be doing what and where, and how the data may be obtained. At a minimum, the collecting agency, frequency of monitoring and reporting, location and quality assurance references should be identified.

9. Description of biological monitoring.

This description should include who will be doing what and where, and how the data may be obtained. At a minimum, the collecting agency, frequency of monitoring, type of monitoring, frequency of reporting, location and quality assurance references should be identified.

10. Availability of Documents.

The submitting agency or entity will be expected to provide, in a reasonable time frame, information for public review.

TDGLTR.ATT
3/8/95
CR/ko

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION
OF THE STATE OF OREGON

IN THE MATTER OF:	)	
	)	HEARING REGARDING
Earth Science Technology, Inc.,	)	UST LICENSE
a California corporation,	)	NO. UT-NWR-94-218
	)	
Respondent.	)	WASHINGTON COUNTY

LAWRENCE S. SMITH, PRESIDING OFFICER

February 15 and 16, 1995

VOLUME III

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Attorney for Department of Environmental Quality

I N D E X

Page

Hearing, Continued, 2/16/95:

EXHIBITS MARKED FOR IDENTIFICATION

BY MR. SHEEHY:

Q: I'm curious about a lot of the, you know, the information. I've asked these questions to everybody else, really. How many tanks have you ever tested?

A: I've never tested a tank.

Q: Okay. So, this is all paper to paper?

A: Well, I shouldn't say I've never tested a tank. I've tested my own home heating oil tank.

Q: Well, I don't care about that. I'll get another [inaudible].

A: Okay.

Q: Okay. And what I was curious about, and we've gone over this before, so I'm not jerking you around.

A: Okay.

Q: You, you indicate a ring test. Would you explain, and I think, because you know, I'm, I'm [inaudible] on phones back in the office, so I don't understand this stuff. What exactly is a ring test?

A: Well, it was a term that Frank Nichols and Jerome Barr referred to as a test that was taken within the neck of the fill pipe.

Q: Okay. But doesn't that have to meet all the criteria?

A: I guess I don't understand your question.

Q: Okay. You have two or three sets of conditions. Now, I don't mean to be holding school here, that you must

meet. You have a head pressure, you have a standard deviation, you have a certain time line. But a ring test, if it doesn't meet that, then you don't have a valid test, is that correct? I mean, I'm, I'm loading the gun, I mean, you can shoot it back at me.

A: Let me go back to the terminology of a ring test. That was the test that they gave to the abbreviated test that they ran. It was a term that they used themselves. It isn't anything written in stone. Now, the test that they said they were running was the EZY CHECK-1.

Q: Okay.

A: In order to run that test, they'd have to follow the protocol.

Q: Would you do me a favor because I'm not too bright. Would you show me what a ring test looks like up on that board, and then I want to take these one at a time.

A: You want me to show you what a ring test is?

Q: Yep. Just put a diagram up there.

HD: Do you want [inaudible] to be part of the record?

JM: Yeah, that's--

BY MR. SHEEHY:

Q: [Inaudible]. I don't care. You can stay there. Take your jacket off and relax.

A: No, as I understand--

Q: Yeah, whatever you need. Okay. And if, and I know I'm going to get hit. He's going to help you out.

A: Oh, is that right? Do you want me to draw it so you can understand it or so I can understand it?

Q: Go, go real slow. I'm not too bright.

A: Okay. We have a tank under the ground. We have a tank. It has a fill pipe. That fill pipe comes up to the edge of the ground, it's in the ground. What I understand the ring test to be as described by, from Nichols, is the level of the liquid was brought up into the neck of the fill pipe, they placed the bubbler tube--

LS: What is that?

WITNESS: It's a bubbler tube, air pressure that bubbles.

LS: Okay.

WITNESS: Air pressure. That's connected.

LS: Could you write that on there? This won't be an exhibit, so everybody [inaudible]. We all see it, but [inaudible]. Okay, great, thanks.

WITNESS: Okay. And this bubbler tube is, of course, connected to an air supply.

BY MR. SHEEHY:

Q: I refer to it as [inaudible], by the way.

A: And it's connected to a chart recorder. This is simple.

Q: We could bring the equipment in from HORNER.

A: Okay. The chart recorder is calibrated by adding liquid, I think it's 200 milliliters, or 500 milliliters

three times--

Q: Well, actually, it's the reverse. You, you-

HD: I think he's the one that's testifying.

WITNESS: I, I, I think they calibrate by putting, I may be wrong, I'd have to look at the--

LS: Do you want to look at that--

HD: Yeah, you probably shouldn't speculate.

WITNESS: Okay. Anyway, they--

JS: I'm sorry.

WITNESS: They add, they add a fixed amount of liquid.

LS: Exhibit 15, is that right?

WITNESS: Of liquid, into the fill pipe. This will raise the level and cause the chart recorder to offset by a certain amount. And they add--

LS: How does it do that?

WITNESS: Well, the liquid raises up, the air is bubbled into this, into this tank and because of the increase in liquid level, there's more back pressure. That back pressure moves the chart by being very sensitive.

LS: The chart is measuring pressure. Okay.

WITNESS: The chart is measuring pressure. And it is my understanding they do that three times, the same quantity of liquid is added three times to put the calibrations, marks on the cart--

BY MR. SHEEHY:

Q: So you're, you put liquid in or you use a dunker?

A: Well, there's two ways to do it. You can, you can either put liquid in or you can use a displacement rod. Yeah, a displacement rod.

LS: Are they the same thing?

WITNESS: Correct. So what, I can use the principal you get in the bathtub and the water raises, so the same difference.

LS: Okay.

JS: [Inaudible], you get in the bathtub.

WITNESS: Anyway. And then the test is continued to be run at that time--

BY MR. SHEEHY:

Q: Okay, could, could--

A: Which is making a--

Q: Why do you do that?

A: Why do you put the bubbler tube in there?

Q: No, why do you hit it three times?

A: Well, it's, the only thing I can say is is to achieve better precision on the, on the chart recorder, to make sure, certain that you in fact understand what this fixed amount of liquid, this fixed elevation--

Q: I'm not giving you a hard time, by the way.

A: Well, look, it's just--

Q: So, what you're saying--

A: Same as making a measure twice and cut once when you, when you cut a board, you know?

Q: So, under any scenario, and I want to get back, we've got a lot of things to go through because you're the expert and I'm, you know, I'm a [inaudible pro back in the office. So, every time you went out to a site, is this what you're suggesting to Mr. Smith, that you calibrate all the equipment every single time? Three times?

A: What I'm saying is, is that's what Frank told me.

Q: Well, that's, you know, hey, I wouldn't buy a used car from him but I mean, I want to make sure the judge understands this, that every one of these tests that we're talking about, and I don't know if that's true, because I'm leading with my chin which I'm known to do, if we calibrated every single test three times, is that what you're telling us?

LS: Holly?

HD: I, I don't understand. What is the question that you're asking him?

JS: Okay. This is extremely important because you're, you know, you're the main man. That we, we're going to get into all of these other things. You're talking about a ring test. I know what a ring test is. What you're saying, and I think this has been completely left out of all of our discussion, that every time you go out on a site unless, you know, you're going to hit me on the side of the head, you're calibrating, if I say any--, I'm not putting words in your, you know, words in your

mouth, that no matter what these other conditions were, that that system was calibrated three times. Is that what you're saying?

WITNESS: I'm saying--

HD: I'm sorry. I still don't think that the question is clear. Are you asking him whether Earth Science Technology employees did that or--

JS: They had to.

HD: No, are you asking him.

JS: Yes, I'm sorry.

BY MR. SHEEHY:

Q: Did they do that?

A: I have no way of knowing whether they did it or not. All I know is what Frank Nichols told me--

Q: Frank provided all the information.

A: Well, we didn't get any chart recorders. Chart recorder--

Q: Well, you don't even need a chart recorder. I'll have evidence for you tomorrow, by the way.

A: It should show on the chart recorder whether you did it three times or not.

Q: Well, you don't even need that.

LS: Why don't you just testify from what Mr. Nichols told you.

JS: Yeah.

WITNESS: Well, he told me that he did it, they

calibrated it three times, yeah.

LS: Okay.

BY MR. SHEEHY:

Q: So, you calibrated every single, not you, by the way, so no matter what was going on, and you can jump in, too, no matter what was going on, it was done accurately

HD: What was done accurately?

JS: The calibration.

WITNESS: I can't testify to that.

JS: I know you can't but, I mean, in theory, we've got 263 containers that we didn't take a look at. Now, what if you go on with temperature and run that one by me, too, because I don't understand that very much either.

LS: Well, I think you should probably be a little more specific on the question. What question do you have about temperature for Mr. Frost?

BY MR. SHEEHY:

Q: Okay. That's the other half--

A: Okay--

Q: That's the other half of the equation. I mean, this is why we're here. Frankly, I'm not sure why we're here, but why don't you explain what the other half of that equation is, so that then we can talk about these test results?

A: Okay. There is, there is a temperature probe that's placed in the tank, there's a temperature probe

placed in the tank. It's at the bottom of the fill pipe, as I understand.

LS: And why is that placed in there?

WITNESS: Well, it's to, it's to determine the, the, no, determine the temperature variation in the, in the tank, stratification of temperature.

LS: And how is that important in terms of detecting leaks?

WITNESS: From that they can determine, well, it actually averages the temperatures electrically, but it allows you to determine whether the liquid in the tank has shrunk because the temperature, the average temperature dropping or has, has grown because of the temperature, the average temperature rising.

LS: Okay. And according to Mr. Nichols, they, you said that when they dropped it, that's what Mr. Nichols told you, that he used the temperature probe or whatever?

A: Yes, that's what he did. Right.

LS: Okay. Any other questions, Mr. Sheehy?

JS: Oh, yeah.

LS: Okay. Let's keep going here.

BY MR. SHEEHY:

Q: If you were testing the tank, let's take the room test, I think that's one of the items that we asked about. Where would that have showed up, in fact, if they didn't perform an accurate test?

A: I'm a little confused about your question.

Q: Okay. There's, you've got a form and I don't know where it is, I think that, I don't need it. I mean, I know the form--

LS: The data chart?

JS: Yeah. Okay. You've got that right there. What is that form?

JM: Wait. What was the exhibit?

LS: Exhibit 16.

JM: Okay.

JS: I don't care.

LS: This has already been entered and it's something that Mr. Nichols said you filled out.

JM: I think it's Mr. Nichols.

WITNESS: Yes. That's right.

BY MR. SHEEHY:

Q: Okay.

A: Well, it would show up in the temperature compensation of this, I mean, if, in reading the data they would place that data every, was it five minutes?

Q: Six. I'm sorry. Whatever. Okay.

A: In that section of the, of the, of the data sheet.

Q: Okay. So, is there any way, in your opinion, let's stay with the ring test, it also, it's folded under to your right hand, by the way.

A: Uh-huh.

Q: That if you did not have the proper head pressure, where would that have showed up?

A: Well, I haven't studied these in a lot of detail, but--

Q: Well, just take that one.

A: You need to have something someplace that would show where the water level was--

Q: Groundwater.

A: Groundwater level was, you'd have to have something to show where the water level was in the tank, if there was any.

Q: Actually, you've only got the front page, by the way, so I'm helping you out. There's a back to that. You've only got the--

LS: So, he's not going to be able to answer that question then, because he doesn't have that form?

JM: Just a second. Is this the form?

JS: Oh, yeah. I'm sorry.

JM: Let's have this marked for illustrative purposes. So, it's the same thing except it has the back--

LS: I'll mark it Exhibit 16B and make the original 16A.

JM: Okay. 16A is--

JS: Any one. I don't care.

HD: That's fine. I know what it is.

LS: Okay. Any objection on that stuff?

HD: No.

LS: Okay. Exhibit 16B is just a blank form, Earth Science Technology [inaudible] Sharp System Tank Tightness Test, is now going to be Exhibit 16B, is the blank form. The original 16 is now 16A, so there's two, and Exhibit 16B is part of the record. Go ahead.

JM: Go ahead and ask him.

BY MR. SHEEHY:

Q: No, I don't need that. So, you know, in a macro sense, we're talking 263 of these containers, is the number, I believe.

A: You know, you've got the data there. You know what has to be taken.

Q: Okay.

A: I don't have any problem with that.

Q: No, I, but my question really gets back to the idea that, let's assume for the sake of discussion, and I hope Holly doesn't have a gun, the worst scenario happens and we didn't do every single thing on here, okay, and I'm giving you the gun, would it have shown up on every single test? You're the expert. I mean, I'm not. I'm, I'm a bookkeeper by trade.

A: I don't know.

Q: Okay. I, I, I always thought I was pretty good on my feet, but you're taking me back a little bit. The,

this document is the HORNER protocol, you're aware of that?

LS: He's referring to Exhibit 16B.

BY MR. SHEEHY:

Q: Yeah, whatever, whatever this sucker is.

A: No, the HORNER protocol, that's a data sheet to record the information that you obtain by using the HORNER protocol.

Q: Yes.

A: Yes, I'll go along with that.

Q: If you will, step by step on this document, under any scenario--

A: No--

Q: I'm in no way suggesting, you know, there wasn't a problem, don't get me wrong. And I'll be sworn right now if you'd like. That is--

LS: [Inaudible] sworn.

JS: Huh?

LS: No, go ahead.

BY MR. SHEEHY:

Q: That is the HORNER protocol.

HD: I think he just testified that it was not the HORNER protocol.

LS: It's a form to--

WITNESS: It's a data sheet--

LS: A data sheet.

WITNESS: To collect the data on it.

LS: For HORNER protocol, is that right?

WITNESS: Yeah, that's correct.

LS: Okay. Alright.

BY MR. SHEEHY:

Q: Okay, in your professional opinion then, I'm starting to sound like a lawyer, which is really embarrassing, is there anything different about this than the protocol? I mean, we have 263, 263 of these things that we're claiming are bad cats.

LS: Okay, what, I guess I understand Mr. Sheehy's question. Doesn't this satisfy the protocol once you put the information in here?

WITNESS: The, the information, yeah, the information is obtained in a particular manner. It's, it's a procedure that was, is dictated by HORNER that you shall do it this way to obtain the information that you put on that sheet. That's the results of doing the HORNER protocol, not the HORNER protocol.

BY MR. SHEEHY:

Q: Okay.

A: Now, you can obtain results to put on that sheet using a variety of methods.

Q: Well, I don't know that we're suggesting that these things were dummied up. That's not a--

A: No, but you could--

LS: Well, I understood Mr. Frost's testimony as

saying that, from what he understood from Mr. Nichols, this information is from the ring test. Right?

WITNESS: Well, I don't know about that information, but yeah, I guess this one is. That's their test they ran, yes.

BY MR. SHEEHY:

Q: Okay. Let's get back, let's get back to that, because I'm in no hurry. The ring test, what you're referring to, and I don't know how I'm going to do this, must meet--, you're, are you familiar with these diagrams on every one of those tests?

A: Yeah. I'm familiar.

Q: Okay. Must meet a set of calculations. And it must meet a 2 to 4 psi rate, which I think you're familiar with.

A: 2 to 5. 2.4 to 5, yeah. Or in some states.

Q: Okay. Do we have any tests to anybody's knowledge that don't meet these criteria?

A: I don't know.

Q: If, I guess, you know, the whole point of this, and I'm just going to go, starting with one, and I've got a whole bunch of items to go through here, if we don't know, then how can we say that the ring test was invalid?

A: I'm not saying the ring test was invalid.

Q: I think I heard you say that.

A: What I'm saying is that the HORNER EZY CHECK-1

protocol was not followed in certain key categories.

Q: Okay. Well, let's take it, I just took the ring test first. And I don't, you know, if you reached 2.4 psi, whether you were sitting up on the roof or you dug a hole, would have no effect on the protocol. Is that correct? If you met 2.4, hey--, I don't want to be here either.

A: A random 2.4 psi is totally independent of the protocol, yes.

Q: Okay. So, it has no effect, really, on the test?

A: I didn't say that?

Q: Well, what, okay--

A: You asked me whether 2.4 psi was, whether it was on the top of a building or in the tank, or whatever you said, was the same psi and I said yes.

Q: Now, we have, now, I can go back and look over all these tests and find out if that's a condition. Did anybody here look over these tests?

HD: Ask the question to him right now.

BY MR. SHEEHY:

Q: Well, I'm, yeah. I mean, did anybody look them over?

A: I have no way of knowing.

Q: Well, we supplied all the information--

A: Okay. I looked at the tests, all, virtually all of the tests and I don't know if there were any that showed any groundwater being present.

Q: Well, that wasn't my question.

A: Well, in order for the test, the 2.4 psi to be there, you have to have the groundwater calculation in there.

Q: But don't you think that--

A: Because--

Q: Did they meet all the pressure requirements, to the best--, I mean, and I'm not kicking pepper on a fly, but did they meet the requirements?

A: Well, without going back and looking up--, at all the data.

Q: I mean roughly.

A: The presumption is that the calculations showed that, yes, it met it.

Q: Okay. It met that one. I'm going to work my way down the hill here as we go after that. Okay. Now, let's talk about groundwater. I think that was your next item. Okay. What is the effect of groundwater on a tank test?

A: Well, if the groundwater outside the tank is the same, at the same level that the liquid is in the tank, you're not going to get any flow one way or the other through the, through the walls as to any hole, except for, you know, boundary movements from the hole, but you're not going to get water to flow into the tank or gasoline to flow out of the tank.

Q: Okay. Now, that's only when the tank is

completely full, is that correct?

A: Oh, at any time.

Q: Well, wait a minute. If I--

A: If the groundwater is at the same level as, as the liquid in the tank, you're not going to get, you're not going to get water flowing in or out of the tank, I mean, whether the tank is, well, is my statement correct? Or didn't you understand my statement?

Q: No, I didn't understand it, because what's, okay, we said that the ring test was one thing. Now, let's talk groundwater, and you're the expert and I don't know that much about it. I've got a container. Okay. You know, whatever size, and I'll, could I steal that, if I thought it was a beer I'd never give it back to you. Okay. Now, let's take this soda and take for the sake of discussion that groundwater was a real issue. And it is, by the way.

LS: Okay. For the record, we're looking at a water bottle that has about four inches or three inches of water in the bottom. Okay?

JS: I thought it was a beer and there wouldn't be three inches in the bottom.

BY MR. SHEEHY:

Q: Okay. Now, if you have a groundwater problem, and let's assume that I'm going to test this with a certain amount of head pressure, I'm going to, this is my standpipe, okay? Then, if in fact what you just described

was accurate, as fuel was taken in or out of this container, it would change completely the pressure, is that correct? Let's assume that the water was up here, you know, pick, I don't care how you do it.

A: Well, the ground--, I mean--

Q: Take your jacket off and relax. It's not like, I mean--

A: Part of the testimony?

Q: Yeah!

A: The, on an empty vessel with the--

Q: We're talking, we're talking HORNER-1 now.

A: Okay. On an empty vessel, let me finish, on an empty vessel, the groundwater always puts pressure on the outside of the tank.

Q: That's correct.

A: Whether it be full or, or empty. And--

Q: And where would it show up inside the tank?

A: The pressure? It would show up on the walls of the tank. It would, it would tend to raise the level in the, the groundwater pressure would tend to raise the level in the tank. Protocol calls for raising the pressure 2.4 psi above the--

Q: Two to 4. You've got to stay under 4.

A: Yeah.

Q: Not to tell you. Is that correct?

JM: You have to ask a question.

JS: No, I'm sorry.

WITNESS: Yeah, I think it says 5 except in, I can't remember what state it is. One of the states.

BY MR. SHEEHY:

Q: California. But that doesn't mean anything.

A: Yeah.

Q: But my point is that under a, if you want to go down the list, one of the first tests ever made in a tank test is to do what? Check for groundwater.

A: Yeah, you check for groundwater. Right.

Q: Okay.

A: At least I do.

Q: And you check inside the tank for water. Now, you have to understand that this is an overfill method and this container, whatever, you know, I've got to give that little girl back her soda, is completely full at all times and most storage containers they take product out of it. So that, you know, to get back to your point, that as the product went down, if in fact there was a leak, what, you know, from the water, the inside coming in, tanks leak from the inside out actually, then you would have a situation where the damn thing would start filling up with water.

HD: Is there a question here?

LS: No.

JM: I don't know.

JS: I'm philosophizing, I guess.

LS: Ask a question.

BY MR. SHEEHY:

Q: My question is, on the tanks that we're talking about, did any of them show up with a lot of water in them? Because that's, the number two issue is groundwater. I mean, do you understand my question?

A: I understand your question. I, I don't recall seeing, seems like to me that there were a few that had water in them, yeah, but I don't recall very many, no. Not big numbers.

Q: Roughly any idea?

A: No, I don't have a rough idea. I'd have to go through the data and specifically look for that.

Q: Okay. In, and I'll ask the same question I asked Rich, these tanks have all been retested, or they should have been or, you know, I don't want to get into the legality of it, do you have any indication under any circumstances of any of these tests that were done that came up south?

A: I have no knowledge.

Q: Would you have been notified if something went south?

A: We are supposed to be notified, yes.

Q: I, you know, I'm not saying that, you know, it's a hundred percent. In your professional judgment, do you know of one case under any scenario that there was any

environmental harm done by any of our tests? And, once again, I'm leading with my chin.

A: I have no knowledge of that, no.

Q: Well, either way--

A: I don't know.

Q: But wouldn't, wouldn't the gang up here have been notified in advance if, you know, if we had a real leak or something that went south? We talked about two.

A: Yeah, the region, our regional people would have been notified, but I wouldn't have been notified.

Q: Okay. I have attempted to gain that, you know, you know, I'm the kiss of death with whoever that guy is, with the DOT, but, so you have no knowledge that there was damage ever done by one of these tests?

A: I have no knowledge either way. I mean, I don't, I don't have the data so I don't--

Q: Well, where does it go?

A: Well, it doesn't go to me.

Q: No, I'm here because of 263 violations. Now, all of a sudden we don't have, you know, nobody's on first. Now, where does this stuff go? Does it go to you?

A: Releases from tanks, or suspected releases from tanks, which would, this would fall under a tank failure, suspected releases would go to the individual regions, either go to the northwest region which takes in the very northern part of the state, or the western region which is

the western part of the state below the northeast cor--, northwest corner and the eastern part of the state which is the east side of the Cascades.

Q: Okay. Let me--

A: Either one of those regions.

Q: Let me just finish up. Taking the ring test in groundwater in psi, Mr. Nichols, and you know, the things that I think you outlined, and I might have left a few out, if you were to test a tank and every one of those conditions was wrong, would you pass or fail the tank? Taking the worst, you pick any scenario you want.

A: Well, the question you've asked is, you're asking pass or fail, if I found information that looked suspicious, I would suspect the test.

Q: No, I understand that. But I'm saying, taking all of the worst scenario, I didn't express myself clearly, if everything listed, you know, by your scenario was wrong, okay? Completely wrong, what would have happened to those tests?

A: I have no idea.

LS: Mr. Sheehy, are you asking if the retesting had come out so that, the retesting come out so that they were not in compliance, there was too much leakage, I guess, would you learn about that, Mr. Frost?

WITNESS: Now, wait a minute now. You're asking me--

LS: 263, have they been retested? I guess that's the

testimony--

JS: Thanks for helping me out.

WITNESS: That isn't what I heard him say but--

LS: Okay, but that's what I understood.

JS: Yeah.

LS: So, 260 that were improperly tested. At least I guess there's been some testimony that a lot of those have been tested again or at least modified or replaced, so if on the retesting they found out that they had been leaking, you know, or at least leaking too much, using the layman's term, would you learn about that? Would they report that to you?

WITNESS: Not to me, no. They wouldn't report it to me.

LS: Okay. I don't know if that's your question.

BY MR. SHEEHY:

Q: It was a better question that mine, probably. What I'm, what I was trying to get at, and I didn't articulate my position, taking the worst scenario of all the things that Rich and Holly are beating on me about, what would the results have been according to the tests? Would you have passed bad tests or would you have failed tests? Give me, give me the worst scenario.

HD: Do you understand that question?

WITNESS: No, I don't understand. The question has to be more specific than that.

BY MR. SHEEHY:

Q: Okay. We've got all of these conditions that we outlined.

A: Do you mean if there wasn't--

Q: The ring test, you know, all that stuff.

A: You mean, that the groundwater wasn't measured accurately, the--

Q: Yeah, all that stuff. I don't care if there's five or if there's 10 of them, you know, however you want to couch it. What would the test results have done? Would we have passed bad tanks or failed good tanks? This is an extremely important question.

A: Geez. I, I have two situations here. One, I don't know, I have no validation as to whether the ring test is even a test.

Q: Okay. Let's assume they were all ring tests. I'm giving you--

A: No, I'm just saying I don't know what that is, so I don't know what a pass or a fail means on that test.

Q: Yeah, you do.

A: No, I don't. I don't have the slightest idea what it means.

Q: You've got it right in front of, under your right hand.

A: No, I don't.

LS: He's [inaudible] on Exhibit 16A, but I think he's

testified that those numbers don't mean anything unless you follow the protocol, I guess, is that right, Mr. Frost?

JS: Well, that's my, that's my point, sir. Let's find out.

WITNESS: I--

LS: I guess I'm still not clear on your question, Mr. Sheehy.

WITNESS: I, I'm not either.

LS: And I guess that Mr. Frost isn't, because he's not answering it, so, uh--.

JS: No, I want to lead to another point.

LS: Okay. Maybe I can try to rephrase them. Okay? You can tell me if it's not--, you mentioned some significant deviation from the protocol.

JS: Yes.

LS: So, I think that's the test you're talking about, so you have this test that has these deviations. If that test was done, where would the error fall? Would that error fall by rejecting one that was probably not leaking or would it fall on the other way which is allowing one that was leaking? Is that the question?

JS: Yes.

LS: Oh, okay.

JS: Thank you.

WITNESS: I'll give you, I'll give you the same answer. [END OF TAPE 5, SIDE A].

[BEGINNING OF TAPE 5, SIDE B]:

LS: B, Tape 5. At the end of Side A, Mr. Frost, I think your answer was cut off and you said that you didn't know because you'd have to do a, what was your point?

WITNESS: I'd have to, you'd have run independent tests on the ring tests.

LS: Okay.

WITNESS: That is run to determine whether it--

JS: Well, no, I'm not even talking about the ring tests. I'm giving you the absolute worst scenario, the worst scenario you can have that everything on your list was wrong.

LS: Okay. The protocol was not followed at all?

JS: It was not followed, we, you know, I'm giving you the worst scenario. This is extremely important, Judge. What would have happened to the results?

WITNESS: Well--

HD: Well, I guess I would just have to object that that isn't relevant in any way.

JS: Oh, yes it is.

HD: I, well, my objection is that it isn't relevant because--

LS: Well, now--

JS: Because I'm going to, could I?

JM: Let her finish.

HD: Because it doesn't matter what the test results

are. If the violation's been committed, then the violation's been committed. Test results are in the [inaudible] unreliable.

JS: Okay. But that's, that's exactly my point. Because my next question was going to be when these tanks, getting back to, we talked with, I don't even know who it was, I'm going to ask the question, you know, these tanks have all, some percentage, 50, 80% of them, have all been retested and, to the best of your knowledge, if I could get my hands on this guy I'm going to strangle him, I tried to get the only two containers, if I'm saying anything you jump in on me, that we know that didn't meet the criteria a year later. Now, if these tanks were all that dead and we didn't follow the criteria, let's assume, you know, I'm giving you the worst scenario, what, and this, you know, I'll go to the board if you like, what would have happened with all of these? Okay? I know the answer by the way. It's a rhetorical question.

JM: He has to answer.

JS: Oh.

LS: I think he already has answered. And that's he doesn't know in terms of whether it be, it would kick out false positives or negative the other way.

WITNESS: Yeah, I have no way of knowing.

LS: And--

JS: But you, aren't you the expert for the state? I

mean, you know, I, I'm a bookkeeper by trade.

WITNESS: I, I--

JS: I'm a CPA.

WITNESS: Okay. What I, what I can say is that each one of these things are significant variations from the HORNER EZY CHECK test. In my opinion, they're significant variations. Theoretically they could show tests, they could show test results that show the test as being tight when in fact it could be, it could be leaking. But it's also possible that it could show it the other way around.

JS: Well, that's not mathematically possible. Either it was going to go one way or it was going to go the other.

LS: Yeah, that's what he testified about, though, that there were certain figures and it would show one--

JS: Well, I'm, you know, and I'm not, you, you weren't sitting in with us. You know. I assume the numbers are accurate that were put in.

LS: Okay, any more questions for Mr. Frost?

JS: No, I think he'd like to get the hell out of here and I don't blame him. But--

LS: Let's see, we've got about five to 5:00 here. Ms. Duncan, any other questions for Mr. Frost?

BY MS. DUNCAN:

Q: So the, the ring test that you described is something that is Earth Science Technology specific, isn't it?

A: Yes, as I understand it.

Q: It's not something that is approved by state or federal government as an acceptable test? Is that right?

A: The, I'd like to back off and say that the, that the government doesn't really approve things. What, what they depend upon is the manufacturer's claims.

Q: Okay. Let me ask that slightly differently then. In the ring test, is a constant level standpipe used?

A: No.

Q: Okay. And then let's take it down the chain. Failing to use a constant level standpipe is in violation of the HORNER EZY CHECK-1 protocol, is that right?

A: Yes.

Q: And violations of the HORNER EZY CHECK protocol are violations of the applicable regulations, is that right?

A: Yes. Could--

Q: So, the full link then is performing the ring test without the constant level standpipe is a violation of the law, is that right?

A: Yes, as I understand it.

LS: Okay, I guess converse to that would be is the ring test, as stated here, would that meet the requirements of federal law, what they, what Mr. Nichols told you he did?

WITNESS: I have no way of knowing. The, the federal law requires the manufacturer to certify that the test

meets the, the, would be able to detect a .1 gallon per hour leak rate of .95.

LS: Alright.

WITNESS: Probability detection of [inaudible] and .05 probability of false alarm, and there's no such claim that I know of, any place.

LS: So, the ring test--

WITNESS: By HORNER. HORNER's never claimed that this will meet that.

LS: Okay. I guess the burden then is on the person who wants to perform a ring test to say this does meet the federal requirements to detect that kind of loss? Is that right?

WITNESS: Yeah, I believe. If they're, yeah, if they're the stated manufacturer of the, of the test procedure.

LS: Okay, I want to, just another question [inaudible] the defendant here, this protocol we've talked about which is Exhibit 11, was that in effect for the HORNER EZY-1 during the period that these tests were done?

WITNESS: It's my understanding.

LS: Okay. Understanding from Mr. Nichols or--?

WITNESS: Mr. Nichols.

LS: Okay.

WITNESS: And from what little research I did, yes.

LS: Okay. And your research involved--

WITNESS: Looking at the manufacturer's literature.

LS: Okay. And this, the one that we've marked as Exhibit 11 today, and I guess you testified that Mr. Nichols provided that, right?

WITNESS: Yes.

LS: And in your study that would be protocol that was in effect during the period whatever that was, April '93 through February '94?

WITNESS: Yes. That's the period of the tank tests?

LS: Yeah, that's the one that, yeah, I'm not trying to trick you. That's what they told me.

WITNESS: Yeah, okay.

JS: Okay. Could I ask one, you know, another question?

LS: Yes. First, though, Ms. Duncan, any other questions for Mr. Frost?

BY MS. DUNCAN:

Q: No, I guess I'm just kind of hoping that we got that last chain of questions clear, that I think the question from Mr. Smith is that could the ring tests have met the federal regulations and I believe your answer was you don't know. Right?

A: That's correct.

Q: And so the, the burden is on Earth Science Technology or on the tester to use a test that is third party certified or is an acceptable test, is that right?

A: Yeah. It's actually certified by the manufacturer.

Q: Okay. And so, the ring test that we've been talking about has not been third party certified, right?

A: Well, it doesn't have a manufacturer. It, I--

Q: Okay.

A: HORNER didn't, which I assume would be the only manufacturer that could certify, didn't certify.

Q: As meeting the regulations?

A: As meeting the regulations.

Q: Okay.

BY MR. SHEEHY:

Q: Well, I'm going to get a chance tomorrow, but I've just got one question. Could I, I don't know how we got hung up on this thing, by the way, have to meet a certain set of conditions, now let's assume for the sake of discussion, and I don't think we've waltzed around on this point, that these numbers were accurately filled out, if in fact "a ring test" -- that's kind of a cute term -- was used and it met all the conditions of head pressure, would it be a valid test?

A: Again, I don't know.

Q: Well, would it be a valid test?

LS: He's asking Mr.--

JS: I'm sorry. I, I don't really care.

LS: Okay.

JS: But you understand my question? Do you know--

LS: I guess, what, what do you mean by valid test?

WITNESS: You're asking me to design, to evaluate the ring test as to whether it would meet the--

JS: Well, the term ring test, I, you know--

WITNESS: The test that was run then. Whatever it was, that was described under, what is it, Exhibit--

JS: Well, I mean, that's, that's, you know.

JM: His question was if it met the pressure requirements, not--

JS: Yeah, did it meet, are these valid tests? We have Pac Bell as a client, as an example, and we actually can't even put so much fuel in because the fill pipe is so far down, it's two floors down, you know, standby generators, and that's what you're calling a ring test.

WITNESS: I understand that.

JS: By law, you can't fill the thing up, because you have too much head pressure--

HD: I think we're getting into testimony again.

LS: Yeah.

JS: I'm sorry.

HD: I think that Mr. Frost has testified he doesn't know.

JS: Well, somebody should know. You know. No, I'm up tomorrow.

WITNESS: I'm not, I--, you know, I can't vali--

LS: Any other questions, Mr. Sheehy?

JS: No. I think I've put my foot in my mouth enough tonight, so.

LS: Okay.

JS: You don't have to agree with me!

LS: Okay. Ms. Duncan, did you have any other evidence on behalf of DEQ?

HD: I think we've introduced everything.

LS: I marked as Exhibit 27, this is the, is the diagram that you prepared, Mr. Frost?

WITNESS: Yes, it is.

LS: Okay. And I'd like to offer that, or just make that part of the record. Any objections, Ms. Duncan?

HD: No.

JM: No objections.

LS: Mr. Manning?

JM: No problem.

LS: Okay. Exhibit 27 is part of the record. And, let's see, okay. I guess, where are we then? Then you're, I guess, in the legal sense resting, Ms. Duncan?

HD: That's right.

LS: Okay. I understand that--

JM: [Inaudible].

LS: Right. Any objection to that, Ms. Duncan?

HD: No.

LS: Okay. Let's come back together then at 9 o'clock

tomorrow.

HD: Okay. I think it would be helpful to know what witnesses--

LS: Okay. Yeah--

HD: The defense is going to be putting on tomorrow.

JM: Well, obviously Mr. Sheehy and--

JS: I think I'll just, I might bring Joe with me.

JM: Joe Moriarty.

HD: And do you intend to bring Mr. Richards back?

JM: We may.

JS: Yeah.

JM: Quite possibly.

LS: And what would he testify about?

JM: To clarify some of his original testimony.

JS: Yeah, we'll, if he's still alive by the way, because I'm going to talk with him tonight.

LS: Well, you're on tape here, Mr. Sheehy.

JM: So, I think we'll probably end up going all morning, realistically.

LS: I need [inaudible].

JM: Oh, yes.

LS: Well, we'll start at 9:00 and do you need any more, do you need any more clarification as to what's happening tomorrow or not?

HD: No, I know what's happening tomorrow. There's a possibility they'll need Mr. Richards, possibility there

will be Mr. Moriarty and Mr. Sheehy.

JM: Mr. Moriarty and Mr. Richards would be quite short, if the possibility comes to it.

HD: Okay.

JM: But Mr. Sheehy I suspect will be quite time [inaudible].

JS: Well, I can say hello and it takes all day.

HD: And do you want closing arguments done?

LS: Sure.

HD: Okay.

LS: Yes, if you can.

JM: Oral arguments?

LS: Yeah, I don't care. Either way is fine with me, but I prefer oral, or it's up to you actually. I don't have a preference.

HD: I think oral argument would be easiest.

LS: Yeah, that's great then. You can just close it up tomorrow then.

HD: Okay.

JS: That's okay.

LS: Okay. I guess we'll see everybody tomorrow at 9:00?

JS: Thank you very much.

LS: You're welcome.

[pause]

LS: Back on record. It's 9:00 a.m. The date is

February 16, 1995. We're going back on record regarding the DEQ hearing for Earth Science Technology, Inc. The same office in the DEQ offices in downtown Portland. Present today is John Sheehy on behalf of Earth Science Technology. John Manning, right. John Sheehy is here with attorney John Manning, attorney for Earth Science Technology. Representing DEQ is Holly Duncan. With her today is Richard Rose, Van Coleus and, I believe, Laurie McCulloch is going to show, or appear, but she isn't here yet?

JM: Who was that?

HD: Laurie is--

JM: Oh, the one in the [inaudible]?

JS: The [inaudible]?

LS: Okay. And also here today is Mr. Richards, who has testified yesterday and is going to be recalled by Earth Science to testify. Before I start, though, I just want to confirm with the parties, Larry Frost has also appeared on behalf of DEQ. Let's confirm for the parties that I sent a letter setting up yesterday's date. Any objection proceeding today, Mr. Manning?

JM: No. Not at all.

LS: Okay. And, Ms. Duncan, any objection?

HD: No.

LS: Okay. I forgot to ask yesterday, and I probably need to at least confirm this for the record, regarding the

Oregon Administrative Procedures Act requires me to send, which is the back of exhibit, second page of Exhibit 5, the procedures and rights, I want to just make sure it's been received and were there any questions about it?

JS: I wouldn't know.

JM: No questions received.

LS: Okay. So that's, for the record, no questions--

JM: Of who?

JS: Of him.

JM: Oh, Mr. Richards. You want to ask some questions?

JS: Yeah.

LS: Okay. First, we're going to, I think the first [inaudible] is to swear Mr. Richards in and then I don't know, I guess, do you have any objections of Mr. Sheehy--

HD: No--

LS: Asking questions of Mr. Richards? Why don't you please stand and raise your right hand, Mr. Richards? Under the penalty of perjury, do you solemnly swear or affirm to tell the truth, the whole truth and nothing but the truth? Oh, okay. Please be seated. And you testified yesterday, right?

WITNESS: Yes.

LS: Okay, go ahead then.

JS: Is it proper, can I ask some questions?

LS: Hold on, though. Please state your name again

for the record.

JS: James T. Richards.

LS: Okay. Go ahead then, Mr. Sheehy.

BY MR. SHEEHY:

Q: Jim, we had a chance, you know, to talk about a lot of things, and he's been very honest and outgoing with me. I got the impression, I'm starting to look like a lawyer, by God, I mean, that's worse than marrying a Protestant. I got the impression that you train these people on a piece of equipment called Schuster, and I'll go very slow, yesterday.

LS: Well, why don't you confirm that then, I guess. Is that right?

WITNESS: Alright. There's, there's obviously a great deal of confusion here. As I mentioned yesterday, my HORNER license had lapsed and I had started using the Schuster-type equipment.

LS: That's at the time you began training?

WITNESS: Yes.

LS: Okay.

WITNESS: There's one, basically one difference between Schuster equipment and HORNER equipment, or I should say, the Schuster test and the HORNER test, and that is protocol. With the HORNER test, you have a pretest period of a half an hour or an hour, depending on how long it takes, and the test period which takes an hour, during

which time the pretest period must meet certain criteria and the test period must meet certain criteria and, when both are compared, they must meet certain criteria.

JS: Do you want me to set this up or?

LS: No.

JS: I'm sorry.

WITNESS: This is, it's very difficult. Now, you have to put this up front. I'm talking to a bunch of non-tank testers, and--

JS: Who are you looking at!

WITNESS: And things, and things that are automatic to me, just like kick out the tank ends, the jargon of the field, to me, tells me exactly what I'm doing, but if it gets terribly confusing, stop me, and I'll try to explain it.

LS: Okay. We'll ask questions, no problem. Go ahead.

WITNESS: So, with the HORNER test, there is a certain protocol you have to follow and certain mathematical manipulations and statistical evaluations that have to be made.

BY MR. SHEEHY:

Q: Why don't you go through that in more detail, Jim?

A: Okay. With the HORNER test, with, with all tests now since December 22, 1990, there has to be a third party certification, and there is a protocol that the third party

uses to, to examine the equipment and determine whether or not it is capable of detecting a .05 leak with a 95% accuracy.

With the HORNER test, you must have a pretest where you take readings every five minutes of the temperature and the liquid level and that, during that pretest you must achieve a result which is within .05, alright? This can be done either by taking 12 five-minute readings or, if the tank is very stable, you may take six readings and multiply it by two. Alright. During the test period, additionally, you take a reading every five minutes, or 12 readings and you have to meet certain stop test criteria that I can't pull right off the top of my head, but it basically says that it must be within .05 in order for the tank to pass.

That material additionally has to be within .05 gallons of the pretest; in other words, if in the pretest you had a plus .04, which is less than .05, and in the test you had a minus .04, the test would be invalid because you're greater than .05 different between the pretest and the test, so you did not, in essence, meet the stop test criteria. Alright.

So, you have to go through all these gyration things and statistical and mathematical manipulations to meet the protocol that HORNER set to get their equipment third party certified.

Q: But, Jim, my question was, and I was taking notes

yesterday, so I wasn't paying attention, I got the impression that we trained these people on a different piece of equipment.

A: This is what I'm getting down to, is where the differences lie.

Q: No, but did, what piece of equip--, if, you know, and I'm leading with my chin again, which I'm good at doing, what piece of equipment did we train these people on?

A: They were trained with the HORNER system.

Q: Okay.

A: They were trained using a Weed Instrument box which--

Q: Well, you better define that.

A: Alright. Schuster and HORNER purchased their temperature boxes from Weed Instrument Company. They then put their name on them and sent them out. Right? Additionally, they buy their temperature probes from Weed Instrument Company. They then put their serial number on them and send them out. Alright? Their standpipes, their constant level standpipes are different, but they're in essence both constant level standpipes.

The HORNER method you must use a chart recorder. That is a device which draws on a graph what the level is actually doing in the tank.

Q: How does that work, Jim?

tinuous platinum wire, that, in essence, measures the temperature, the relative temperature within a tank.

Q: Is, and I appreciate your coming back by the way, you're not the enemy, but, on any of the test results, and I have them all back at the hotel room, can the operator dummy those up? Under any circumstances, any way, without physically taking down the numbers?

A: With the HORNER or the Schuster test method? If you want to give me a blank sheet of paper, I can write a test.

Q: No, but assume they showed up and they did, you know, in other words, don't you have something in front of you that verifies everything you're doing?

A: The temperature box gives you a temperature to the nearest thousandth of a degree, and the chart recorder measures volume changes. It's right there. And when you're done--, the temperature box, no. You have no printout. That's all done by the operator taking the readings. The chart recorder gives you a graph that has a line on it that shows you what the level has done throughout the test.

LS: In the bellows part there, is that right? The air pressure--

WITNESS: Yeah, the bellows drives, drives a pin that records on a round, on a circular graph.

LS: And that's the bubble?

WITNESS: That's the bubble. Mm-hm. Alright, that

increase which would, of course, cause the bubbler to have to use more air pressure to force the bubble out of the tube, which would show on the chart. Alright? So, when you were done, as an example, had you used the .05 rod and when you inserted it into the fuel, if the needle had moved 10 lines, then each line obviously, on that graph, each line would be equal to .005 gallons. That way you knew when you read the graph what any change on the graph meant. In form, in terms of gallons.

So, that on each graph there is a calibration at the beginning and should be at the end, because they can change over a period of time, which indicates that the graph was measuring and what each line on the graph represents. Alright?

My understanding at this point in time is that the protocol has changed and that they now add a known volume of fuel to do the same thing, to calibrate the--, so.

Q: Alright. Could I put you on the spot?

A: You can do whatever you want. That's what I'm here for.

Q: What do you think about all of these people coming here with this? Is there anything wrong with their tests? And I'm leading with my chin again, obviously. What do you think about this?

HD: Can, we need a little bit more specific.

LS: Yeah, you have two questions there. What do you

think about the people, what do you think about the tests. I think probably more--

BY MR. SHEEHY:

Q: How about the tests. Did these people know how to test?

A: These, you should be referring to these people, you're referring to--

Q: To--

A: Jerry and Frank?

Q: [Inaudible].

A: Alright. When I trained them, they knew how to test the same way I knew how to test. And they were as good as beginners can be. If you're going to ask me about the test, I'm going to have to see a test and say, yeah, that's a good test, no, that's not a good test. They, one of the most difficult things to train a man with, the HORNER or the Schuster system, is the mathematics. Did they know how to do the mathematics, yes.

Q: Because it worked backwards.

A: Um, a tank test is a very simple operation in theory. It's very, very simple. In reality, a tank test is very, very difficult because tanks are strange things and you have air pockets and you have just a multitude of things that occur, and these things you learn in the field. I mean, nobody, there's no magical way that a person can teach tank testing and say, you now know everything there

is to know about tanks. I run into strange things every day. And I've been in the business for a long time.

Q: Let me ask you another question because I, if you just took that protocol which Holly keeps beating me over the head with, can you just follow that and test a tank legally? And just follow it verbatim?

A: You threw a bad word in there, Jack, which was "legally". Alright?

Q: No, but you, you couch it, you couch it any way--

A: If you had asked me that question two years ago--

Q: We were talking this morning--

A: Two years ago when I took the first page of that protocol and I went through that and tested the tank according to the first page in that protocol, I would say yes, that was a legal test. Because that's the protocol I knew. Now, can you, can I go out and do that today? No, because I now know that there's an addition to that protocol.

Q: But if you, let me ask the obvious question, if you hit the standard deviation and all the other conditions, and you know what I'm referring to, is that a legal test? In your judgment?

HD: He can't make a conclusion--

JS: Yes, he can--

HD: About whether it's a legal test.

JS: Yes, he can.

JM: Well, in his opinion. We're talking about opinion.

JS: Yeah, what's your opinion?

LS: Well, I think I'll allow that question. I mean, he's talking a little bit about his understanding of the rules.

WITNESS: Yeah, we're still talking a whole different world. Is it a legal test? I mean, you're asking me--

BY MR. SHEEHY:

Q: No, that's, that's--

A: If you want an answer to that, you're not going to like my answer.

Q: Okay.

A: Alright? But if you want me to answer that--

Q: Oh, yeah, I asked the question.

A: Alright.

Q: I'm leading with my kisser again, but.

A: Yeah. No, it's not a legal test because it didn't follow protocol.

Q: Is the tank leaking?

A: Now, that's a different question.

Q: Well, that's my point.

A: Would I think it's a good test, probably so.

LS: Okay, let me just understand that. Pages 2 and 3 of the protocol wouldn't help you, well, what you're saying is that if you just follow the first pages, you'd still

have a pretty good idea of whether the tank was good or not, is that right?

WITNESS: Yes.

LS: Okay. Great.

WITNESS: Well, we're talking about legal versus how I feel about a test. That's two totally different things.

BY MR. SHEEHY:

Q: I got, I don't know, I feel like a [inaudible]. This is scary.

A: And let me clarify one more thing if I can.

Q: Sure.

A: When I test in Washington--

Q: The state or--?

A: The state of Washington.

Q: Okay.

A: I fill out a form, there's a question on that form that says, was this test done according to manufacturer's protocol. Alright? If I sign yes to that, that means legally I have done every step in that protocol that the manufacturer's third party certification requires which, in my opinion, says I have given that chance, that tank every chance in the world to pass or fail. Alright? Now, if you want to know is that a better test, I don't know. I have, I used to be a scientist. I have not run the definitive studies on, on using another protocol. I don't know whether the other protocol will give you a .05

test. I don't know the answer to that. Do I feel good about those tests? Yes.

Q: Well, let me ask you this. You, you're from Southern California, I think.

A: Most recently. I'm from Utah, but yes, most recently from Southern California.

Q: You've tested in many different states?

A: Yes, I have.

Q: Okay. And different counties. And California, if I could, is by county, okay? The rules are different at each county level. Have you ever, ever, when you were testing down there, under any circumstance, had one of your tests come back and bite you in the gobonjos [phonetic]?

A: Have I ever had a test that didn't--

Q: Went south. You know. When they pull the tanks and, you know what I'm referring to.

HD: No, I don't. What do you mean by going south?

JS: Um, okay. I think Jim--

LS: Well, if she doesn't understand it, I probably don't either.

JM: Just in layman's terms, polite terms.

JS: Okay. In California, Jim, you jump in. What I'd like to do, Judge, if we could, if anybody has any questions here--

LS: Well, Ms. Duncan will have a chance to ask some questions in a little bit, but she's just asking you to

clarify.

JM: Just ask that question again, Jack.

JS: Okay.

JM: Just ask the question in a different way.

LS: Are you saying that the test, the tank later determines that it leaks?

JS: Oh, it's much more complicated than that, sir.

LS: Okay, well go ahead.

BY MR. SHEEHY:

Q: Jim, Jim can jump in. Okay. California is the only place in the world and, Jim, you jump in, that has it by county.

A: Or by city.

Q: Or by city, so you have very, very stringent regulations as far as Santa Monica, as an example--

A: Santa Ana.

Q: Santa Ana, where they have to send a policeman out with you, which is a scary thought, it's kind of a miracle you ever come back. All of these rules, the way the law is written in California and, Jim, you jump in, is that you have federal laws, then you have state laws that cannot be anything less than a federal law, then you can have a city law. Santa Monica, as an example. Did you ever under any circumstance, when you were working in California, have a problem with something going south?

HD: I guess that's, I still need--

WITNESS: Do you want me to define that for you?

HD: Okay.

WITNESS: What does he mean by going south. Did I ever have--

BY MR. SHEEHY:

Q: No, it's did he--

A: Did I ever have--

Q: Did he screw it up!

A: Did I ever have a test where the results were not indicative of the condition of the tank. Alright? I have to go through a little gyration here, because on any test that I found questionable or that the tank was in essence a test failure, and I want to make this an absolute point. We do not as tank testers tell that person they have a leaky tank. We tell them that they have a test failure.

They have the opportunity at that point to go have someone else test it, to do whatever they want. That is not, we do not say your tank leaks. The only way I can know a tank leaks is I can watch it leak. But I can tell them they had a test failure. My policy is now, and always has been, and when I was with Earth Science, that if I had a test failure, I would have them leave the tank alone and out of service for 24 hours, I would go back and do a retest. At no charge, by the way.

Q: Well, define that. A different person, different piece of equipment or, you know, when you say a retest,

what do you mean?

A: Well, we would go back and retest the tank, do a complete separate test and, generally, we would try to send a different tester to that location.

Q: And different equipment.

A: So--

LS: Is that right? Different equipment?

JM: Different equipment, too?

WITNESS: Well, when I was there we used only HORNER-1, so. We used HORNER-1.

BY MR. SHEEHY:

Q: That's not my point. But a different vehicle--

A: Different steps, yes.

Q: It would be--

A: Yeah, different set of equipment.

Q: Different set of equipment.

A: Same type of test, different set of equipment. But we always wanted to verify. Having a leaky tank, digging up a tank is not a cheap thing to do.

Q: No.

A: It costs a tank owner sometimes hundreds and hundreds of thousands of dollars if they've got a leaky tank in there, so we don't go out there and tell them, you have a leaky tank very lightly. We want to make sure that when we tell them they have a test failure, they have a test failure. So, have I ever had tank tests that didn't

turn out to be what I told the customer? As far as leaky tanks are concerned, no. Every tank that I said leaked was a leak. And, of course, if I had tanks out there that I passed that in fact were leakers, I wouldn't know about it until whenever they discovered they were leaking, and when the leak occurred I don't know.

Q: Did you ever have that?

A: No, I never did. I've never had, never had a problem with someone uncovering a tank. As a matter of fact, we endeavored on most occasions, and still do, to help the tank owner identify the location of the possible leak.

Q: Okay. Why don't you define that? What do you mean? The line of the tank or?

A: Alright. A leak, most leaks occur in tanks either in associated piping, and this is a misnomer, most leaks in a tank system occur either in the associated piping or at the bungs of the tank top. Very, very few tanks per se leak. Alright? So, if you allow a tank that's been overfilled, that the level is up to grade, up to the ground level, if you allow that to sit for 24 hours after it is a failure and you go back to the site, you can then note the level of the fuel.

Q: Define that, Jim, in terms of this, okay?

A: In what?

Q: Okay, if you go back 48 hours later, what

happens.

A: Alright. That's what I'm saying. You can measure the level of the fuel at that time. It's generally a very good indication of where the leak is because the fuel is going to continue to leak out until it gets to the level of the leak, then it will quit leaking out. Alright?

After you have familiarized yourself with numerous tank systems, you will know that at approximately 11 inches above tank top, there's an "L" that goes to the vent. You will know that there is a second "L", probably six to 12 inches below grade. There's, if it goes down to about an inch above tank top, it's probably in one of the bungs that either fill riser, phase 2 or phase, or excuse me, phase 1 vapor recovery riser, something along that line.

So, that when you get to the site, you can help the tank owner and say this leak is probably at tank top. It is probably in the first joint on your [inaudible] pipe. Whether it's there or not, I have no idea, but at least you can give them an idea. Do you have to dig up the tank? Maybe not. Maybe all you have to do is uncover the top of the tank.

We're there, as testers, well, obviously, we're there to make a living. We're also there to help our customers. We care about people with tanks in the ground for a couple of reasons. Number one, if they pull them out of the ground, we're out of a job. Number two, we know how costly

it is. Mom and Pop service station up here has a leaky tank, they're bankrupt. His military retirement is down the tube. I mean, it's pure and simple. We're not talking little things here. We're talking millions and millions of dollars. So, there's a lot more to being a tank tester than, than writing numbers on a sheet. So.

Have I ever had a test go south? No. I have had, I have had instances, and had one recently, I tested a tank in July, the tank tested good. I got a call from the tank owner. He said he had water in his tank. I went out there and, of course, the fill was right there under his roof where all the water in the world ran down the fill and I told him that's probably the problem, but let's retest. We retested. The tank leaked. It was a classic leaker. Al-right?

Upon discussing this with the tank owner, and this is another thing tank testers do, I had discovered that they were thinking of replacing the tank. They had somebody out there trying to determine the diameter of that tank using a metal rod to prod around inside that tank. Yeah. Do you want to call that go south? It wasn't leaking in July; it's leaking in December. Alright. But that's not go south. No, I've never had a problem with a tank test.

Q: Can I, I'm going to throw the grenade out. We had two people that you tested, you know, worked with, and if you don't want to answer this, that's fine with me, come

in and make a suggestion originally, and I'll speak up, okay, in the media suggest improper training, improper equipment. How would you respond to that?

A: I have a couple of answers for that.

Q: I figured you would.

A: Mm-hm. We can go around and around.

Q: No, no, no.

A: But let's talk about the equipment situation first. Alright? When I came up to train these guys, two things. Number one, there was one standpipe.

Q: Okay. Wait a minute. What type of standpipe?

A: There was a HORNER constant level standpipe.

Q: Yeah, the [inaudible].

A: Yeah. There was one. Alright? Which I might add, the first time it ever had fuel in it was when I came up to train these guys. I think they were using it as a planter box prior to that.

Q: Jesus.

A: Alright? When, when we were done with the training, I gave you a list, Mr. Sheehy, I gave you a list of what I thought the boys needed.

Q: Yeah.

A: The testers up here. Alright? That's as far as it went. I was here for four weeks and one of the things that, that Jack and Joe had asked me to do was see what kind of equipment was available and what they had, what

they needed. I made a list and I gave it to you, I think I gave it to you with the bill. So, equipment yeah, they were lacking. They had one standpipe.

LS: Please hold. I need to turn the tape over. [END OF TAPE 5, SIDE B].

[BEGINNING OF TAPE 6, SIDE A]:

LS: Tape 6, hearing for Earth Science Technology. At the end of Tape 5, Side B, Mr. Richards was testifying. Nothing was said while I changed the tape. Go ahead, Mr. Richards.

WITNESS: Okay. Now, the other part, what was the other part of the question? Now I'm lost. I was listening--

BY MR. SHEEHY:

Q: I just, I mean, were they capable of accomplishing task A or that type of thing?

A: Alright. There was--

Q: That's training and equipment.

A: Yeah. The training, I came up and I trained them in my method that I knew to be the protocol when I was doing HORNER testing, which to me was the method we used. I had been using it for years. Which, as I mentioned yesterday, the first time I had seen the three-hour wait after a .4 pressure drop was a couple of weeks ago. Alright?

Q: That would--

A: But I had not been using HORNER equipment for years. And I might add to that, that when I trained them and we were discussing earlier and I never got to finish, we were discussing the differences between Schuster and HORNER, and I got down to the bottom line and I said the only difference is protocol. I don't know, nor do I remember, and if you have the tests we can go over them and I can show you, there are, the only real difference between the HORNER protocol and the Schuster protocol is that with the Schuster protocol, you only have to have 10 consecutive 6-minute readings that come in to .05 or less.

Q: But if I could ask a question.

A: Mm-hm?

Q: Under what I did, you know, we talked before, so I'm not blind-siding you. I had stuff faxed out here from you. Under the Schuster piece of equipment, there's no wheelie.

A: No, I mentioned to you earlier this morning that that is an option with the Teleleak system, with the Schuster Teleleak system. You may either read it directly off the standpipe--

Q: You know what I'm referring to.

A: Or you can use a wheelie.

Q: When you were training these people, did they have a wheelie?

A: Yes, we used wheelies.

Q: Hm.

A: I, if we looked at the tests that were done while I was training them, we can tell what kind of tests they were.

Q: I know. They have wheelies. That's what concerned me because you--

A: Yes.

Q: You made the point yesterday that you trained them on a different piece of, a different toy, or I misinterpreted. Now I think I'm hearing that we actually didn't train them on a different toy.

A: They were trained on the equipment that was here at Earth Science.

Q: So that's a HORNER-1? That's not the Schuster.

A: Right.

Q: Okay. I misunderstood that because I'm, you know, I'm not too bright, as you well know. But I thought I heard yesterday that we trained them on a different piece of equipment.

LS: Okay. Well, it doesn't sound like it, so go ahead. Any other questions?

WITNESS: Yeah, the equipment virtually is identical.

BY MR. SHEEHY:

Q: Alright.

A: Alright? Whether you're using Schuster or HORNER. The equipment is identical. It's the protocol

that's different. And, additionally, when we're talking the HORNER test, I think I might add that you guys, well, a lot of the people that are here, have seen test results from Earth Science Technology, the test result sheet, etc. I designed that. I know what a HORNER test is. So, I understand the differences between the two? Alright?

And I think you will find if you go over those tests that were done while I was up here training, I think you will find that most of them are HORNER tests, because the boys were going to be using HORNER equip--, Jerry and Frank were going to be using HORNER equipment. Any test that I went out on alone during that period of time, I probably would have used Schuster protocol, because it's quicker and simpler.

Q: But does it meet all the federal regulations?

A: Yes. Schuster equipment is third party, or Schuster method is third party certified.

Q: What does that mean?

A: That means it's been tested by an independent laboratory and has been shown to detect a leak at .05 gallons per hour with a 95% accuracy.

Q: Okay. Could I ask a theoretical question then, and I won't put you on the spot. Of course, you know me and I like to put you on the spot. We had two people in here that testified yesterday at some length about all kinds of problems, that they weren't really properly

trained or qualified or didn't test correctly. How would you respond to that? I don't even know these guys. I wouldn't even know who the hell they were if they walked in. How would you respond to that?

A: I trained them to the best of my ability. When I left, they were probably as capable of, of testing the tanks, using the same methods I did as anybody could be after the training period.

Q: Now, what's the, how long, the HORNER school is like four days?

A: The HORNER classes is four days.

Q: And you trained them for over what?

A: I was here--

Q: What, what, what I'm getting at, and one of these individuals, two of them actually worked with you, is that correct?

A: Frank does testing for me, yes.

Q: Okay. Why are they here saying these tests aren't any good?

HD: I don't think he knows why they're here.

JS: Yeah, I do. Excuse me.

BY MR. SHEEHY:

Q: Why are they here? I mean, do you agree with all of this?

A: I--

Q: I'm leaving myself wide open.

A: No, I think you're really putting me on the spot with that one. Do I agree or don't I agree? Do I get to impugn my own training techniques? I don't know that, I know this much. I was here for four weeks. When I left, I was comfortable with their abilities. What happened during the following year or however long, I don't have a clue. I'm not part of it, I'm not part of Earth Science, I don't know. Did I train them improperly? I don't know that either, because I don't know what HORNER's protocol was at the time I was training. I knew the protocol I had learned. Where we go from that point I don't know.

Q: But did you get any feedback from their tests that there was a bad cat? I think we have two that I'm going to pick on [inaudible], I think we had two with DOT?

LS: Well, I guess I should probably enter something here. It sounds like, Mr. Sheehy, you're really attacking the rules. The rules require, at least as I read them, is that the protocol is to be followed in all cases. Now you're, in effect, trying to say, at least from what I hear, and you can correct me if I'm wrong, that even though the protocol is the way of doing it or that's the way to test, your method was just as good as the protocol.

JS: That's correct.

LS: Okay. But if the rules don't say that--

JS: What if they do?

JM: We'll get into that during questioning.

LS: Well, yeah, I mean, you can talk about that, but I guess what I'm saying is that if you aren't following the rules, and you can say the rules are no good, but I'm not sure I'm going to be the person who's going to say, well, I'm going to disregard the rules. So. Because I'm not an expert and those are rules that are promulgated by the DEQ.

JS: Okay, let me try it another way.

LS: So you might, I mean, I understand you want to try to establish that your tests were just as good as if you'd followed the protocol. Is that what you're saying?

JS: Well, not exactly.

LS: Well, okay. Well, I want to make sure.

BY MR. SHEEHY:

Q: Okay. "The protocol" and that's the word that, you know, we've been beating into the ground. Now, you had a standard deviation. What is that? I can never figure that out. What is it?

A: All the standard deviation is is a measurement of the accuracy of the, of your data.

Q: Okay.

A: In other words, could this data have happened by random chance.

Q: Okay.

A: And the standard deviation that is applied to the HORNER, HORNER test says that there has to be less than a .01 probability that that data occurred by random chance.

Pure and simple, that's what a standard deviation is. It's a test of your data.

Q: Let's assume you've topped off the tank five minutes before the test, you know, I'm taking the worst scenario. Could you possibly have signed off on that or could any of these guys have ever signed off on one tank test? In other words, you know, assume, you know, you hit it from 50° weather at, you know, whatever. Could, would it be a legal test--

A: Could you go in and start testing immediately after top-off?

Q: I'm taking the worst scenario.

A: No.

Q: So, every test that we looked at should have showed up with an SD, a standard deviation?

A: If the standard deviation were not within .01, it is not a valid test under HORNER protocol.

Q: Could you look at a test result but, you know what I'm talking about, could you have looked at a test and found out that that was a problem?

A: You run it on your calculator.

Q: So you would have known?

A: There's a--

Q: We've got 263 of these that we're talking about.

A: There is a square on your test form for writing in the standard deviation. You run the standard deviation

on your data before you leave the test site.

Q: What's a leak rate? I don't understand that. As I, you never let me--

A: Leak rate, leak rate is a misnomer. Alright? It is illegal to have a tank in the ground that's leaking. I don't care if it's leaking two drops an hour. If you can see that tank leaking, that's a bad tank. The industry has used the terminology "leak rate" to indicate, now this is really going to confuse all of you.

LS: Well, I think I understand a little bit. I mean, assuming some sort of error rate within the--

WITNESS: Yes, what they're, what they're saying is that the tolerance of the equipment is that you must be able to detect a leak of .05 gallons per hour. They have, someone down the line called that leak rate. If your, if your test results indicate a leak rate of .1 gallons per hour, that's what you would assume is the tank is leaking at the rate of .1 gallons per hour. If the tank, if your test results indicate that the tank is within .05, you are within the limitations of that equipment. It doesn't mean, and I have gone, I might throw this in, I have trained numerous county inspectors on to how to go out and do a tank test so that when they went out and observed them, they could understand, and so that when I turned in a test result that said leak rate .0475, and the next tank had a leak rate of .0089, that one tank wasn't tighter than

another tank. Both tanks were within the tolerance of the equipment. So, such that if you had a leak rate of .04999 added infinitum, you are within the tolerance of the equipment.

BY MR. SHEEHY:

Q: But it's still leaking?

A: No, it doesn't necess--, no, that is within the tolerance of the equipment.

Q: No, I understand, but in theory there is still fuel leaving that particular container?

A: No, not necessarily.

Q: Oh, okay.

A: Not necessarily. The equipment manufacturer, the third party certification says that that equipment will detect a leak at .05 or greater. Anything less than .05 is within the tolerance of the equipment. So, leak rate doesn't necessarily mean leak rate. It means tolerance of the equipment.

Q: But isn't that the main criteria here in Oregon?

A: That's the EPA criteria.

Q: Yeah. Now, the state of Oregon or L.A. county, you know, can set higher standards. But isn't that the requirement? In other words, let's take HORNER. We'll pick on HORNER. You pick on anybody you want. I don't really care. That if you had "x" number of containers, there is a margin of error in everything that you do, is

that correct?

A: That margin of error must be within .05.

Q: Okay.

A: Yes. Plus or minus .05.

Q: Yeah. Well, if you get a plus, you've got a real problem.

A: All that's doing is saying that your equipment will detect a leak of .05 with a 95% accuracy.

LS: So, as I understand, Mr. Richards, you're talking there's like a margin of error then?

WITNESS: Yes.

LS: In terms of the equipment?

WITNESS: The tolerance of the equipment. I have a set of equipment that I now use that is 99.9% accurate at .05 level. That doesn't make it any better or any worse than any other equipment, because the tolerance is .05 with 95% accuracy. That's as simple as it is. And that's what the federal government calls for and, to my knowledge, no one has changed the leak rate threshold.

BY MR. SHEEHY:

Q: No.

A: There's not a city, state.

Q: You can make it tighter, but you can't make it looser.

A: No, but to my knowledge, no one has changed the threshold.

Q: Just certain cities in California.

A: Have they changed the threshold? Well, I didn't know that.

LS: Okay. Any other questions, Mr. Sheehy, for Mr. Richards?

JS: Not really. I thank you. I thank him for coming back. That was nice of you.

LS: Okay. Before he's excused, though, any questions, Ms. Duncan?

BY MS. DUNCAN:

Q: Well, I guess, I don't want to cover things that we covered yesterday, but I just want to make sure that, that we didn't get off track today or that we're confused, so let me just walk through a couple of them.

You said that you trained Frank and Jerry to the best of your ability, isn't that right?

A: Yes.

Q: And what you also said is that you're not, you weren't familiar with HORNER EZY CHECK protocol at the time, is that right?

A: With the current protocol, I'm not sure whether I was or not, no.

Q: Right. And didn't you assume that Mr. Nichols and Mr. Barr would be sent to the HORNER school?

A: It wasn't an assumption, and I think I said yesterday that they were going to attend the next available

HORNER--, one of the reasons when I talked to Joe and Jack was they said they couldn't get them into a HORNER school until at least May and that's why I came up to train them.

JS: Why couldn't we get them in until May?

JM: You can--

JS: I'm sorry, Holly. Go ahead.

BY MS. DUNCAN:

Q: So, didn't you, you would then assume that they were going to be sent to the HORNER school in May?

A: Mm-hm.

Q: Is that right? And so, the training that you provided was kind of the wisdom of a tank tightness tester, isn't that right?

A: Oh, absolutely. I tried to pour everything I knew into them.

Q: Yeah, you gave them a lot of tips on how to test--

A: Oh, yeah. Absolutely. What tanks do to you, the do crazy things they do. Absolutely. And theory.

Q: And then today you testified that you weren't familiar with the three-hour wait until a couple weeks ago, is that right?

A: That's a fact.

Q: Okay. So--

A: I don't know even when that became a part of HORNER protocol.

Q: So, you said today that you, that Mr. Nichols and Mr. Barr were prepared to go out and test when you were done, but isn't it true that they weren't trained to test tanks per the HORNER protocol?

A: Ma'am, can I answer that in two parts?

Q: Mm-hm.

A: Okay. Per the HORNER protocol as I now know it to be, no, they weren't. Per the HORNER protocol that I knew, yes, they were.

Q: Mm-hm. And what you said before is that you weren't familiar with the HORNER protocol, is that right?

A: I wasn't doing HORNER testing at that time and, no, I hadn't kept up. If they had changed the protocol, I had the old protocol, I had the books that Earth Science had on premise to go from, which had the same protocol that I knew.

Q: And then there was another point that came out today, that when you were done training, you submitted a list of equipment Mr. Nichols and Mr. Barr would need when you were done with your training. Is that correct?

A: I gave Jack a written list of equipment that they had and what I thought they needed, yes.

Q: But as far as you know, that equipment was never provided to them, is that right?

A: From that point, I don't know for sure. I mean, I'm not going to commit myself one way or the another,

because I don't know. Alright?

Q: And we'll be tapping into your knowledge of the regulations for, failing to follow protocol is in violation of the regulations, isn't that right?

A: That's, if you want to look at the letter of things, that's a fact.

Q: Right. And--

A: Alright? There are occasions when protocol cannot be followed.

Q: Mm-hm.

A: Okay? I brought some of those up yesterday.

Q: Right. And that's, the wisdom of tank tightness testers is that sometimes the, the regulations to you as the practitioner may seem somewhat cumbersome, is that right?

A: More than cumbersome.

Q: Okay.

A: I have, I said time and time again, and this is for your benefit, it's not for their benefit. They already know it. If I were an equipment manufacturer and I were paying a third party three to $400,000 to certify my equipment that it will do this, I'm going to write a protocol which absolutely will not allow my equipment to fail that test, so that I have to turn around and spend another three to $400,000.

JS: Explain that.

WITNESS: Do I think that the protocol has become cumbersome? Personally, yes.

BY MS. DUNCAN:

Q: But you also then--

A: But they honored the protocols.

Q: Yeah. You recognize that they must be followed in order for the test results to be legal?

A: In order for them to be valid, not valid but legal, yes. You must follow the manufacturer's protocol. That's what it says in every test, every state exam, every exam you take. Tests are done according to the manufacturer's protocol. That's why I told you the Washington forms we fill out, we have to sign a line that says this test was done according to manufacturer's protocol. The reason I use U.S. test equipment is because I can follow manufacturer's protocol and get in and out of a site in a decent amount of time.

Q: So, you don't really know then whether Mr. Nichols and Mr. Barr followed the protocol from April '93 through February '94, do you?

A: Well, I have no idea. No, I wasn't here. I was in California running my own business. What they did, I have no idea. And you asked me two questions that I can't answer. Did they get equipment? I don't know. Did they follow the protocol? I don't know. Do I follow the protocol out on every test? I could answer that. Did they

follow the protocol when I'm sitting on their shoulder? I can answer that. Other than that, I can't answer the question.

Q: That's all.

A: I don't know what else to say.

LS: Okay, Mr. Sheehy, any other questions of Mr. Richards?

JS: Yeah.

BY MR. SHEEHY:

Q: Easy one, Jim. In the entire industry, I'm getting back to what we were talking this morning, so I'm not setting you up, taking every step, you have to follow the protocol or would an operator know if a test was good or bad? This is extremely important, because the whole issue here, we're talking about protocol.

A: Okay. There are steps in protocol--

Q: Well, let, let me interrupt you again, Jim. Or would you know from the HORNER form, I didn't know you had to sign that, by the way.

A: I knew when I was managing your Upland office.

Q: Yeah. Isn't there all kinds of check lists that you can make on the form itself? Do you know what I'm referring to? I didn't know you had to sign it, by the way. I didn't know that. That, assuming that somebody cut corners or assuming, for the sake of discussion, that nobody follows the manufacturer's protocol, and if I'm

saying something, you disagree with, wouldn't you know immediately if that was a good or bad test?

A: I, somehow I'm not understanding what you're asking me.

Q: Okay. If you, if you took one of these forms, you know, HORNER [inaudible], and you know Jack. He could be outwitted by a green plant, if you went through that thing and followed every single step, and let's assume you did, or you didn't, and that's what Holly and, you know, and Rich and these people are really saying, that you got a bad result, but aren't there all kinds of other criteria where you could tell, you know, standard deviation, would you know when you walked off that site that you had a good, a good tank or a bad tank?

A: That's a question that I think I answered before, alright? When, if I went out and did a ring test--

Q: Okay.

A: Okay? Which is totally illegal, alright? It doesn't tell you anything, there's never been any quantitative studies done to find out whether that's a good test or a bad test.

Q: Well, let's assume you had the head pressure.

A: And I had, yeah, let's say I had a tank that when it was filled to grade had five pounds of head pressure on the bottom.

Q: Right.

A: And we can't exceed five pounds of head pressure. And I put my bubbler and my temperature probe in that tank, alright? I am not going to bring the level above grade because I then, am then exceeding, I guess it would be what the manufacturer says or what I know as a tester, to be the pressure I can put on that tank without popping the ends out.

Q: Jim, explain that. What are you talking about? In other words, let's take Pac Bell.

A: Well, let's do it this way. Let's suppose I've got a tank--

Q: Here, I can--

A: That's buried in the ground 20 feet. Two hundred and forty inches. So, it's 240 inches to the bottom of that tank and it's filled with diesel fuel. The manufacturer suggests that you do not exceed, and the manufacturer test equipment, recommends that you do not exceed five pounds of head pressure. And we talked about the column and the weight and--

Q: You've got me there.

A: The whole thing. At 200 inches with diesel fuel, I am applying 6.2 pounds of head pressure to the bottom of that tank. And we're looking at 240 inches up to ground level. It's going to scare me right to death if I've got that at ground level, let alone bringing it above grade.

LS: What, the constant level standpipe or something

like that or?

JS: No.

WITNESS: No. Because if I, every time I raise the fuel level in that tank, I am exerting unreal--

LS: Yeah, I understand that--

WITNESS: Unreal pressure--

LS: Well, why would you bring it up above ground level?

WITNESS: Because all of the overfill tests call for a standpipe. You bring the level above grade.

LS: Okay.

BY MR. SHEEHY:

Q: But, Jim, are you in violation of the law like with Pac Bell?

A: No. In violation of the law as far as what?

Q: In other words, you could blow those tanks apart.

A: This is not, I'm not breaking the law, no, but I'm sure taking a hell of a chance on popping the ends right out of that tank.

LS: Well, why would you test that then?

WITNESS: This is what I'm saying. I, at that point, did a ring test, which is where the fill riser comes up and the fuel level is right there. I can put my bubbler in there and I can measure the level of that tank up and down. Just as easily as I can on a standpipe. Alright? When I'm done, would I feel that that was a good test? Absolutely

I would feel that was a good test. Was it done according to manufacturer's protocol and would it be a legal test? No.

This is tester option. You've got to use your head when you're out in the field. There are instances, and I told you guys about acetone yesterday. Am I going to bring acetone above ground? No. Am I going to bring benzine which is a carcinogen, above ground? No. This is a tester option. Is the test a legal test? Not according to the letter of the law, it certainly is not a legal test.

BY MR. SHEEHY:

Q: But is it accurate?

A: There again, as I said, I don't know. I haven't run the definitive studies to say does that meet a .05 95% criteria. Do I feel like it's a good test? Yeah. Is it? I don't know. I tested a product called Idoxuredine [phonetic] in animals which was a great anti-herpes agent. We put it into human beings, we broke the double blind four weeks later, because human beings were dying. Did I think those were a good drug in my animals? Absolutely. Did it turn out to be a good drug in humans? Absolutely not.

How can you make a call? Well, that's my background. What do I do. You ask me a question, that's as good an analogy as I can give. Does a tank leak when I get done with that test? If I say no, I'd be willing to bet my reputation no.

Q: How about the two guys that you trained? When they walk away from those jobs?

A: I think I mentioned yesterday, and I'll stick with this till the day I die, that anyone I have ever trained, my biggest point of training is you don't leave that site until you either feel that the tank is a good tank or the tank is a bad tank. You, you develop, good testers, excuse me, good testers develop kind of a feeling. You can look at the equipment, you can read numbers out of the equipment, those numbers can say that tank is beautiful, if you don't feel that those numbers are right, there are so many variables that can make a bad tank look good, make a good tank look bad, and you get used to reading those numbers and somehow you know that what you're saying isn't what you have. So, one of the biggest parts of my philosophy is you feel good when you leave the site.

Q: Well, let me ask you this, Jim, and it's, you know, I'll buy you a cup of coffee, we'll take a break or something. At any time under any scenario working with me or any part of our company, were you ever under any pressure to cut a tank short or walk off a job site or test 10 to 12 tanks or do anything that you weren't comfortable with? And I'm leading again with my kisser.

A: Alright. Was I under any pressure to cut--

Q: In other words--

A: To cut a tank short? I think everyone I've ever

worked with knows better than to ask me to cut a tank test short.

Q: Well, no, because we have testimony--

A: Because that's the last thing they'd ask me.

Q: And we've got documents that suggest that I was doing that. You can call me a lot of things, but don't call me crook.

A: Have you ever told me to cut a tank test short? No.

Q: Did you, were you allowed to be compensated for, you know, however long you were out there doing it? In other words, my idea is, did the company ever want to cut things short? To the best of your knowledge? I'm starting to talk like a lawyer, which is really embarrassing.

A: Here again, if you're asking me did anyone ever tell me to cut a tank test short, no, nor would they, because they know what the answer would be.

Q: Yeah.

A: It's my fanny on the line out there as a tank tester. It's not your fanny on the line. It's my fanny on the line.

Q: Well, me, too.

A: I lose my license--

Q: Of course, I've got [inaudible]--

A: I'm out of there.

Q: Okay. So, there was no, no suggestion that we

were doing this intentionally?

A: That you were doing. I don't know what you're driving at. Doing what intentional?

LS: I don't think it's really an issue here, whether it's intentional or not, so.

JM: Allegation of intent.

JS: Well, it was in the media.

LS: Well, we're not, briefs weren't issued by the media and we're not [inaudible] issues by the media, so.

JS: Jim, I don't have anything else. You know.

JM: Could I ask like two questions?

JS: If we could take--, sure.

LS: Go ahead, Mr. Manning.

BY MR. MANNING:

Q: The HORNER protocol which you're talking about, to your knowledge, you testified that you followed the HORNER protocol that you knew when you trained these guys, right?

A: That's right.

Q: What year, or about what date do you date that from? As far as your knowledge of the protocol? You said 1990, does that sound right?

A: Probably would be, the protocol that came out initially on December 22, 1990, when the third party certification became law, rule, whatever you call it, came into effect.

Q: Okay.

A: From that date on, as I said yesterday, prior to that date I could stick my finger in the tank, I could watch the level move on my finger, if I was willing to sign a certificate that said that's a good tank, that was fine.

Q: Okay.

A: Alright? At 1990, December 22, you had third party certifications. Any tank test done after that time had to be done according to the protocol that was set forth in the third party certification. We got a protocol from Jack Horner. That's the one I knew.

Q: Okay. And that was from December 1990?

A: Mm-hm.

Q: And that's the one you knew at the time you tested these guys in 1993? Trained, in 1993?

A: Yes. That's what I said.

Q: Okay.

A: If you look at the sheets that Earth Science uses, I designed the new data collection sheet when we got the new protocol.

Q: Now--

A: Because, prior to that, I only had to take readings every 15 minutes.

A: Let me just ask the question.

JS: I've got them out. What I might have to--

LS: Is this what you're talking about?

JM: Yes.

LS: 16B for the record. Exhibit 16B for the record. Go ahead.

JS: That's--, okay. That's, that's misleading. Extremely misleading. It's not filled out yet.

LS: Well, I mean, he said he developed a form. I just asked him if he developed this form?

JS: That's a scary [inaudible] statement.

WITNESS: Alright, if you will notice on this form, alright--

LS: Is this 16B for the record?

WITNESS: It's just got the 12--

JS: That's the big--

WITNESS: Okay, it's got 12, 12 slots here and 12 slots there.

LS: That's, is that the back?

WITNESS: That's the back also.

LS: Okay. I'm not sure if it's an important point, but I guess we've established it now. Go ahead.

WITNESS: Well, it becomes important, important here.

JS: Yeah.

WITNESS: Prior to that, the protocol that we followed was that during the initial pretest period, we took four readings. We took one reading every 15 minutes.

BY MR. MANNING:

Q: This is prior to when?

A: Prior to the third party certification.

Q: Okay, 1990.

A: 1990.

Q: So you're talking about something that went way back before?

A: That's right. When I was training in August of 1990, we took, during the pretest period we took a reading every 15 minutes. Those readings didn't have to match anything. Those readings were to tell us that tank's ready to test, then we went into the testing. Now, and you only needed to take a reading every six minutes, so you ended up with 10 readings, alright?

In December of 1990, when everything changed, and the third party protocol came about, as I mentioned earlier, there was a pretest that had certain criteria and a test that had certain criteria and all of the forms that we had been using to that time were obsolete. We couldn't use them, because we had four lines in the pretest. Now we needed 12 lines in the pretest. We need a space for other mathematics that now needed to be done.

Q: And that's the protocol you learned?

A: That's right.

Q: After December 1990?

A: The initial protocol I had.

Q: And that's the protocol that you used when you used the HORNER-1 EZY CHECK method?

A: That's right.

Q: All that time?

A: That's right.

HD: What time?

JM: All that time after December 1990.

HD: Up until when? What time are we talking about?

JM: All the time from December 1990 until now, right?

LS: When did you stop using the HORNER?

WITNESS: Yeah, I quit using the HORNER EZY CHECK-1 in March of 1992.

BY MR. MANNING:

Q: Okay. You quit using it then.

A: That's right. I went to, I went to Schuster equipment.

Q: Okay. But you used the December 1990 protocol from December 1990 until March '92?

A: That's right.

Q: Okay.

A: I used that protocol that I had gotten in 1990.

Q: Now, and that protocol that you learned in December 1990 was the protocol that was on the first page of that Exhibit 11, that, you know what I'm talking about? The, the--

A: Protocol sheet.

Q: Why don't we grab that out. But that's what you said yesterday.

A: We're really taxing my memory because I got a protocol sheet from Jack. I worked for Earth Science Technology.

Q: Okay. You got a protocol sheet from Jack?

A: Okay? Which he got from HORNER.

Q: Right.

A: And he says here's the new rules. Okay? Was it that sheet? Hell, I don't know.

Q: Okay.

A: This is, we're talking five years ago. Do I know if these identical things were on there? That seems a little longer than the one we got in 1990, which wouldn't surprise me a bit but, no, it looks very similar.

Q: The point is, the protocols have changed over time.

A: Oh, yeah.

Q: By HORNER. There's no fixed in stone, the protocol. It's changed over time.

A: As far as I, well, it seems to have.

Q: Okay.

A: Because it seems to be different than the one I hired to.

Q: Yes. Do you know why the protocols change? There's a piece of equipment by a manufacturer, why would they change the procedures on it?

A: I don't know.

Q: You don't have any idea?

A: The reason I don't is that these, this equipment has been third party certified.

Q: I understand that.

A: Alright?

Q: Mm-hm.

A: It was certified according to certain protocols that the third party utilizes to say, yes, this equipment meets certain criteria. If you want a personal opinion, if you were going to change the protocol, you would have to recertify that equipment. Now, if you're going to ask me, were all these things that I wasn't aware of part of the protocol in 1990, I don't know. They very well could have been. Did I ever read the third party certification? No. It wasn't my job to read the third party certification.

Q: Okay. So, from all your experience and knowledge of this, you're saying that, at least in your opinion, if you change, the manufacturer, let's take HORNER, changed the protocol, then that would have to be again subject to a third party recertification, given the new protocol. Is that what you're saying? Isn't that what you just said?

A: I would think that. In my opinion, I would think that, that if there's a change in protocol, that you would have to recertify because the protocol is in fact those things that you must do in order for that equipment to perform as the third party said it would. So, by all of

me, all of these things that I never saw, like the three-hour wait after the .4 pressure drop, that may have been a part of their protocol in 1990. Did I ever see it? No.

Q: You confuse me, though. I thought you said you were aware of the protocol in 1990.

A: I was aware of the protocol that I saw in 1990 and, presumably, that was the protocol.

Q: Right.

A: Presumably it was. But I didn't read the third party certification, because it's this thick, to see exactly what they did--

Q: Okay. [Inaudible] Thanks, Jim.

BY MS. DUNCAN:

Q: What is it, I have one question that I want to clarify. So, when you're saying that you had protocol from 1990, you don't know that you had the complete protocol. Is that right?

A: Right. I don't know.

Q: Right. So you don't know if there was a requirement for a three-hour wait after the .4 pressure drop, is that right?

A: Or third-party certification. I have no idea. I know what I got from HORNER or from Jack that he got from HORNER.

Q: Right. So, you don't know if, what protocol applied at the time you were training Frank and Jerry, is

that right?

A: That's right. I went by what I knew.

Q: Okay.

A: I went by what I had been using and, I'll be very honest with you, if there was a three-hour waiting time after the .4 pressure drop, there are hundreds of tests in California that were done illegally.

Q: Okay.

A: By me. I'll make that admission, because I didn't know that that was part of the protocol.

Q: Okay.

JM: And you still don't know if it was? In the 1990 protocol?

WITNESS: No, I don't. I have no idea.

LS: Okay. Any other questions, Mr. Manning?

JM: No. That's it.

LS: Ms. Duncan, any other questions?

HD: No.

LS: Okay. I guess we probably need to take a break. He's starting to roam here!

HD: Can he please go home?

LS: Ms. Duncan, you don't have any objection to him leaving, do you?

HD: Mr. Richards? No, Your Honor.

LS: Okay. Mr. Manning, any objections?

JM: Nah.

LS: Okay. Thank you, Mr. Richards.

JM: We appreciate him coming back today.

LS: Okay. Let's take about 10 and then we'll take Mr. Sheehy's testimony then, right?

JM: Uh, yeah. He can't wait to be sworn, you know.

LS: Okay. Well, this is his chance.

JM: That's what I've been telling him.

LS: Alright. We're going back on record. It's about 10 to 11:00. We're going back on record for Earth Science Technology. Let's take your testimony then, Mr. Sheehy. Please raise your right hand. Under the penalty of perjury, do you solemnly swear or affirm to tell the truth, the whole truth and nothing but the truth?

JS: I do.

LS: Okay. He said yes for the record. I don't know if you want to [inaudible]--

JM: Do you want to go, do you want to go now or did you want to call somebody else?

JS: Uh, what I had in mind, this is kind of an adventure. This is like "As The World Turns." I'd like to ask Rich a couple of questions. I will do whatever you want.

LS: Okay. You sure you don't want to testify first?

JS: No. I've got one or two questions. I kind of ran into some people.

LS: Okay. That has nothing to do with this case, right?

JS: Oh, yeah. I'm, I'm not out dating.

LS: I'm just, not a very good joke, I guess. Any objection, Mr. Rose?

RR: No, I'm fine.

LS: Okay. Why don't you come over here then and I'll swear you in.

JS: Well, he, he can--

JM: No, he has to--

LS: Well, okay, I actually need him a little bit closer to this microphone. Under the penalty of perjury, do you solemnly or affirm to tell the truth, the whole truth and nothing but the truth?

RR: Yes, sir.

LS: Okay. Please be seated. He said yes for the record. You're now under oath again, as you were yesterday, right?

RR: Yes, I am.

LS: Okay. And you testified yesterday, you're Richard Rose.

RR: Yes, sir.

LS: Okay. Go ahead.

BY MR. SHEEHY:

Q: Okay. The only, I've got a very simple question. As I said, I ran into somebody in the elevator. Is there any indication under any scenario that there was a problem with any of these tests, with the exception of two?

A: We answered this yesterday.

HD: He certainly answered that yesterday. I mean--

LS: I think so.

HD: We can walk through it again.

LS: That was a question you asked of him yesterday, too, was whether there was any problem and I guess the definition of problem is whether there's a legal problem and I think your answer was yes, but--

JS: No, but, could, could--

JM: [Inaudible].

LS: Right. And I think he said more than once that he doesn't know. Okay? Maybe the two that you mentioned yesterday and possibly two more or--

JS: There could, there could be more than that.

LS: Okay, there's two that he knows that were false negatives, is that right?

WITNESS: Yes, correct.

LS: Okay. So, there were two that were false negatives at Kaiser and the city of Dallas, okay? And then there's two possible ones at ODOT, but you don't have much information about that?

WITNESS: No, I don't recall that. All the information in that letter.

LS: Okay. But, other than that, I guess you didn't have any other information, Mr. Rose?

WITNESS: I have no--

LS: That's what I heard you say--

JS: No, what, I guess what my point is that what we're talking about here is two potential, and I couldn't get a hold of the individual, as you well know, so there could be zero, but let's assume two, you know, as a number, you know, that we, we couldn't filter out. The, you know, whether these tests were legal or not.

HD: I don't think that that's an accurate statement.

JS: Okay. Well-

LS: Well, okay, you'll have a chance to respond to it. I think I have Mr. Rose's testimony. Did you have any other questions for him?

JS: No.

LS: Okay. Thanks, Mr. Rose.

WITNESS: Thank you.

JM: Now he can be sworn.

LS: He is sworn.

JM: Oh, you did swear him?

LS: Right, yes. So, I'm not sure how you want to do this. Did you have questions, Mr. Manning?

JM: I'm going to ask some questions and then he's going to do some, he's going to give some rather lengthy answers.

LS: Okay.

JS: What I'd like to do--

LS: You don't have to, you can just stay right there

actually. But, that's okay. Go ahead.

JS: No, no, no. I mean, I was hitting everybody here so I--

LS: Okay.

JM: Jack, what I'm going to do, if it's okay with you, is just ask you a series of questions to start out, okay, Jack? Ask you a series of questions I want you to answer to start this out? And then we'll get into where you can kind of narrate or explain. Is that okay?

JS: Yeah. But what I'd like to do, too, though, if it's possible, if I can say a few words, is that Mr. Smith, you've suggested that, you know, only certain people can ask questions.

LS: Right.

JS: Okay. I would like to change that.

LS: Well--

JS: If I could. That anyone in the room under any scenario can ask me any questions that they want.

LS: Well, I think they would. I mean, if you're saying that Mr. Coleus or Mr. Frost or Mr. Rose had any questions, that they could ask them, I just, I think they've worked it to Ms. Duncan, so unless you wanted to have an opportunity to ask questions of Mr. Frost, Mr. Rose and Mr. Coleus, did you want that opportunity or?

JS: No, anybody in the room--

LS: Okay.

HD: That could become a little chaotic. What, what, I guess we'd prefer is, Judge, to have the direct testimony and then if these guys have any questions, then we'll consult with them.

JS: Okay. But anyone in the room.

LS: Okay. I appreciate your offer, but I think we'll just go the way we are, so I think, Mr. Manning will have a chance to ask questions, you'll have a chance to add anything, and Ms. Duncan may have some questions.

JS: Okay. Whatever you want.

BY MR. MANNING:

Q: Mr. Sheehy, where do you live?

A: Clairmont, California.

Q: And could you describe your basic educational background?

A: Okay. I have a degree in economics and mathematics from Brown University which, for the people in the western part of the country, is a small school in Providence, Rhode Island. I went there on a full NROTC scholarship [END OF TAPE 6, SIDE A].

[BEGINNING OF TAPE 6, SIDE B]:

LS: This is Side B, Tape 6. For the hearing of Earth Science Technology. I think we may have just got cut off the end there, but you said you received a degree and--

BY MR. MANNING:

Q: Repeat that, where you got your degree. From

Brown--

A: Brown University. It's a small school in--

LS: Providence, yeah. Okay.

WITNESS: I was an [inaudible]. I then spent 10 years in the United States Marine Corp during the sixties, which was quite an adventure, but it makes what I'm doing here today look like child's play. Then I went on, I was the controller for the instrument division of Bausch & Lombe, which is a company out of Rochester, New York. And we formed this company approximately 10 years ago.

BY MR. MANNING:

Q: Earth Science, you're talking about now?

A: Yes. I'm sorry. Earth Science Technology.

Q: Who's we formed this company?

A: Okay. Joe and I--, Joe Moriarty and I formed this company and the idea was initially, and I think this becomes somewhat important because of the spirit [inaudible] and things that I've heard here today. The spirit of the thing was my wife dresses me. You know. I don't wear a coat and tie normally. It was the idea that we wanted, I wanted to get out of the, the corporate structure, if that's a poor choice of words.

And then we went out and we started from scratch. We built up this company. And I've been at it for about 10, 10 years.

Q: Okay. For the record, what is the business that

Earth Science Technology's in?

A: Okay. We, we danced around on a lot of things. Initially, you were getting into removals, upgrades, things like that.

Q: Of what, just for the record.

A: Oh, I'm sorry. Tanks.

Q: Underground tanks?

A: Yeah. Underground tanks. And we made a conscious decision that what we wanted to do was just test tanks. Period. And what we do, and California, I hate to say California up here because everybody hates me, but the idea was that in California you have everything, and I think we talked, in fact, I was just talking with them downstairs. In California, everything is by county, so the idea was that we would just stick with tank testing. Okay? Now, so we got going. I'm about a mile and a half from my office, which I think is very, very good.

And I think the other thing that my, my [inaudible], you know, aren't working too good, but the idea that what we have done and maybe, can I describe the company?

Q: That's what I want you to do, sir.

A: Okay. Okay. And we just concluded, and I'm trying to work on, a five-year agreement with the FAA. And all of this, by the way, you know, I will supply data, I mean, you know, I'm the enemy so nobody believes me anyway. And I'll supply all this information. But we work between

Guam, American Samoa, Hawaii and all to the East Coast, and I will provide all of this information to anybody that wants it.

Q: What's your position, Mr. Sheehy, with the company? Officially what's your--

A: Well, I'm supposed to be the secretary-treasurer of the company, but actually the kids in the office, I think, run the place. They don't like me coming in, but--

Q: Who's the president?

A: Joe Moriarty. But I think the idea is not, and it's, it's extremely important, really, a company that's been in business for 10 years, in my judgment, in my judgment, and anybody that wants to jump in, you've got a blank check, okay? You couldn't be in the environmental in California, in my judgment -- and you would disagree -- and make a lot of mistakes. The insurance would come back and haunt you.

And, in my judgment, and I will provide all of this information, Mr. Smith, we probably have 4,000 clients, and we go out and we test these stupid things and we do a lot of other things. What we did as a matter of policy is that we hired, we actively recruited, and you heard about some of those people today, we actively recruited retired and semi-retired people. Engineers, technical people, that type of thing. And they're great. They are really great. They do a great deal for the company.

What is extremely frustrating to me, and I don't know, you know, you stop me if I'm--, is that we have, this is the first time in the history of the company, 10 years, that I'm here doing this. This is nutso as far as I'm concerned. You know?

I mean, we, we wouldn't be in business today if we didn't show up at site "X" or site "Y" and accomplish the kinds of things that we want to do. And I think what, what bothers me a great deal, and I'm going to go into any questions, I'll stay here all day long and answer any technical questions that anybody wants, what bothers me is the idea that you're, you have these off-site locations. We have offices all over the country, by the way.

And I'm, I'm on the record, I think, Mr. Smith, that this is the first time in 10 years we've ever had a situation like this. And what kind of astounds me is we have three situations from three people, and I think you've all, you know, had a chance to, you know, diddle around with them, this is the only one we've ever, ever had and I want to be on the record with that. And what I'm saying is that an environmental firm like ours or a tank testing firm, all's you have to do is screw up one or two tank tests. In other words, Holly owns a corner gas station and you try to sell it and you try to do things like that. I mean, we're out of business.

We had one problem at a place called Dana Point

[phonetic].

LS: Okay. I'm not sure if you need to get into that. Okay? But, so, the only problem you've had during that period is one case, right?

WITNESS: At Dana Point. It took, you know, to the best of my knowledge. Of course, coming up here is an adventure but--

LS: Besides this Dana Point, there's some concern about that, but you don't need to get into that, because we're not talking about that today.

WITNESS: Well, no--

JM: [Inaudible]

WITNESS: But, but actually, could I--, okay. That went away.

LS: Okay.

WITNESS: So, we, we have 4,000 clients--

BY MR. MANNING:

Q: How many tank testers do you have, about, if you could estimate?

A: Thirty.

Q: Okay.

A: And we go out and we test underground containers at all times.

Q: Can you tell the, Mr. Smith, your personal background in you personally doing tank tests, your education in tank testing?

physically go out and test a container. And this was a Pontiac dealership in Riverside which was really embarrassing.

LS: Well, I'm not sure if you're going to need to get into other tests.

JM: I'm just trying to get your experience, Jack.

JS: Okay. I've tested, I've probably tested more, you know, I, I'm just going to guess a thousand containers. And I don't know the number.

BY MR. MANNING:

Q: Using HORNER-1?

A: HORNER-1, yeah. Okay. That was the only thing that was on the market at that time. And we heard some testimony this morning, which I'm starting to talk like a lawyer, and I heard the use of the word pressure test. These are not pressure tests.

Q: What kind of tests are they?

A: Okay. They're volumetric.

Q: Define that.

A: Okay.

Q: Just define it--

A: Could I steal your cup? Okay. In the old days, a pressure test was that you would take an inert gas -- argon, whatever it was -- and then you would seal up the container and then see if it changed. Now, the problem with that, of course, was and there's no, there's no liquid

drop the fuel into the container and you've got to let the fuel settle so that, and I think a lot of the people that came in this morning, Richards was pretty good. I thought I'd kill him in the elevator, but that's a waste of time. You know? That you can't test a container under any sequence of events because of the expansion and contraction problems.

So, once again, though, you guys are the pros over there. If I'm saying anything that you disagree with, you raise your hand. I'll go over it. So, what you've, you've got, you've got two sets of conditions under federal law. One is that the volume, okay, let me explain that. Okay? You've sealed up this container. The volume goes up or goes down because of a temperature change and you calculate this against the size of the container.

Let's assume you've got a 500-gallon tank. You couldn't get much of a chance. Let's assume you've got a 10,000-gallon container, you know, a .00, you know, that type of thing, so you've got a lid. And that's basically what we did. Or what we, I thought we were doing up here. But the mechanics of this thing, and I, Jesus, why don't you come over here and sit with us? You make me a little nervous.

But the mechanics of this thing, the suggestion of a lot of the things that we're talking about here is that the operator did or didn't do certain things. And they, they

might not have. And I want to be credibly clear, make sure he doesn't have a gun. If you use the equipment that's involved, and it's third party certified, unless you absolutely falsified records, there is no way that whatever the result was could be right or wrong. It can't be done.

And that's where the third, I mean, let me explain third party certification, if I could. The federal government stepped in and, initially, when we had the business, you could have a divining rod and go out there and walk around with a stupid stick and you could pass a tank, but then they got into the idea of how to mechanically make sure this thing works, and you don't have that option.

And the other thing that I think is, you get me philosophizing, the only worst thing you could do is put a beer in my hand, I'll be talking all day, but the whole idea of this thing was to put some type of criteria into testing a tank. And that's basically where the term third party certification came from. That it was out of New Jersey and they started this up and they really got into it.

And what my point would be that in California which, you know, is by county and by city, and I think Jim said that, the restrictions down there are brutal. And I think we attempted to make sure, and this gets back, and Holly's going to beat the hell out of me, we attempted to make sure that every employee we had under any scenario never walked

off a job, under any circumstances, if they didn't feel they had a valid test.

Q: Jack, I'd like to maybe come back to that, but I'd like to move along here. In terms of, of HORNER, we hear of HORNER, where are they located?

A: Okay. Bay City, Michigan.

Q: And what do they do actually? What is HORNER?

A: Okay. The father was out of Phoenix, Arizona. Jack Horner, Sr. Good guy, by the way. And I've met him many, many times. He was in charge of maintenance of gas stations, things like that. The kid, the kid's a piece of work. Now, at that time, you had pieces of equipment, they do not, and this is extremely important, they do not manufacture anything under any circumstance, any way. What they do is like from a Weed or Vista back house, they buy all this stuff and they put these toys together. And what--

Q: What are you referring to when you say toys?

A: The equipment.

Q: We've got to make sure that's clear.

A: The equipment. Now, if you bought the exact same piece of equipment because one of these, you know, these people came in here, HORNER does not manufacture anything under any circumstances, so you could pick up the phone today and, unless you were the village idiot, I mean, you wouldn't do it, you could buy the same probe that's, it's

the thing--

LS: Right. I remember--

WITNESS: For temperature.

LS: Right.

WITNESS: Okay. You could buy that thing for $600 from Weed Instruments. If you went to HORNER, it would cost you like two or $3,000. So it's, you've got to meet Horner. He's a piece of work.

BY MR. MANNING:

Q: Jack, when we're talking about HORNER-1, can you describe to the Hearings Officer, what is a HORNER, what is included in a HORNER-1 kit or what, just what are we talking about?

A: Okay. You mean the test itself?

Q: No, the HORNER-1. What is a HORNER-1?

A: Well, there isn't a HORNER-1.

Q: What is it? What do we call it?

A: Okay.

Q: No, when we refer to a HORNER-1, what are we talking about?

A: We're talking about two, now, you interrupt me now. You're the expert. We're talking about two basic pieces of equipment.

Q: What are those?

A: One measures volume and one measures temperature. And the operator then records who's on first type of deal.

Q: The changes in the--

A: The changes. But one of the problems that you have with like an overfill method, in my judgment, is that the math is actually backwards. In other words, if temperature goes up, volume goes down. And we've had problems with people understanding that.

Q: Is there anything else involved in a HORNER-1 other than those two pieces of equipment?

A: Yeah, there's all kinds of toys that you take with you. Your air tanks and things like that.

Q: Could you just define those so we're clear? What else you take, what else--

A: Okay. What you're going to do, and I think that, if I can steal your pen, what you're basically going to do--

Q: Okay, why don't you, he may want to take notes.

A: I'm sorry. What you're going to do is, I've got a container and it has a certain size -- 5,000, 10,000, whatever the number -- you're going to attempt to regulate the change in temperature through, I call a bubbler. Most of these terms, by the way, you know, I made up. And as the temperature and as the volume changes, you record, I think we've got one here. You actually record the differences. In--, the equipment is certified by third party. Horner's an idiot, in my judgment. The equipment seems to work. It's third party, which is extremely important now.

Q: Why is that?

A: Okay. In the old days, and I'm not that old, although I'm getting old quick if we have any more meetings like this, in the old days you did not have to be certified through the federal government. You did not. '91 maybe.

Q: You're testifying, Jack.

A: Oh, I'm sorry. I think it was '91 that they jumped in on this thing with the idea that you had to meet a certain set of criteria. And I think that gets really back to the heart of some things that Richards, I had a nice talk with him downstairs, was talking about. There is a suggestion here that these criteria for tank testing, and Dan or, you know, Larry, you jump in, is static. That's just not true. This has been, you know, this is just not true. The criteria was to accomplish, and I could go up to the board, a certain set of conditions that had to do, when you heard me beating on people--

Q: Jack, when you refer to criteria, are you referring to what we've previously been referring to as protocol?

A: No.

Q: That's a different--

A: That's a different thing.

Q: Okay.

A: You, I'll take the FAA as an example. We have a five-year, and this is all, you can all question this

because, you know, nobody believes me anyway up here, I'm the enemy, but you have a five-year, we have a five-year agreement with the FAA, as an example, very serious stuff. You have a set of conditions that must be met and you have a technician with you at all times. You know, you can't go on [inaudible]. I think--

Q: The conditions must be met for what purpose?

A: That the damn thing is leaking or not leaking.

Q: Okay.

A: And I think that's what we really want to get at. And the thing is, and I'll talk to all of you, or do you have any more for me. He's kind of nervous about me, but I'm a loose cannon.

Q: Now, have you trained people in the use of HORNER-1?

A: Yes.

Q: How many people, do you estimate?

A: Twenty, 30. I don't know.

Q: Could you right now, if you had the HORNER-1 equipment, go out to a site and do a test?

A: Yes.

Q: And feel it was accurate?

A: Definitely. I think you've got to, well, the kids in the office would think it wasn't, because they think I'm a loose cannon, so they wouldn't want me out there. They think I embarrass the company, but I could

actually do it.

Q: Okay. And this third party certification happened, you think, about late '90, 1991?

A: I don't know. Do you have that there?

Q: I have that here. Does that look like it? I'm referring to, I believe it's Exhibit No.--,

HD: I'm not sure we've actually had that one marked as an exhibit.

JM: Haven't we?

HD: The third party certification?

JM: Yeah. Number 10.

LS: Yeah, I think it has been.

JM: Exhibit 10.

HD: Oh, okay.

LS: Yeah, it's Exhibit 10, right.

JM: They object.

JS: Thanks.

JM: Do you want to dig it out, Mr. Smith, or should I just use--

LS: I have it.

BY MR. MANNING:

Q: This is, this is the same as Exhibit 10. Do you want to take a look at that?

A: No, I know what it is.

Q: You know what it is?

A: Yeah.

Q: It says volumetric, right? That's what we're talking about, right, volumetric tests?

A: It's not, and I'm picking on Larry. These are not pressure tests.

Q: You mentioned that. Okay.

A: Not to pick on you, by the way.

Q: Are you familiar with the HORNER EZY CHECK-1 protocols?

A: Yes.

Q: Okay. It was a protocol in 1990, correct?

A: Yes.

Q: That was, was that the first one?

A: Oh, no, no. No. That's what I--

Q: Why don't you explain about HORNER-1 protocols.

A: Okay. It's changed over the years. Let me explain that. And I think Jim, Jim Richards explained that this morning, I think, which is kind of interesting. Initially, when all this equipment came on the market, you could sell anything. The best test, really, is, and I think Jim said this, and if I'm paraphrasing anything or, you know, is that you just fill the damn thing up. Now, we're talking a volumetric test. They just fill the damn thing and came back, I think he said 48 hours later.

If the damn thing isn't leaking, you don't even need this program in the United States. I mean, this thing's a joke. If you just fill that damn thing up and came back 48

hours later, or 72 hours later, and the fuel was still, this was what I recommend to [inaudible], is still sitting there looking at you, where the hell did the damn thing go? I mean, you really don't even need that.

So, when we go like to Guam or Samoa or places like that, that's basically what we tell people to do. I think that--

Q: Jack, excuse me, I want to steer you back to my original question, was about the, the HORNER protocols. Can you explain your understanding of the protocols?

A: Okay.

Q: There's been several protocols, is that right?

A: Oh, definitely. Definitely. Not just, not just HORNER by the way.

Q: Okay.

A: HORNER is an overfill method.

Q: Right. Why are the protocols changed from time to time?

A: Okay. That's a good question. Now, HORNER, you know, the reason for that is the federal government stepped in and said we want a third party certification of all of your toys. Everybody's, by the way. It's not just HORNER.

Q: Right.

A: And that was in New Jersey. And I can't think of what, where the hell was it in New Jersey, that they evaluated the--

Q: Jack, you have to answer the questions.

A: Oh, I'm sorry.

Q: We've got to play it that way.

A: I can't think of it. So, you had to then go into this and so it's an evolutionary process where I think Jim was talking or something and, in the old days, it was 15 minutes.

Q: With HORNER-1?

A: With HORNER, that's all we're talking about. HORNER-1. And you would fill out this stuff and one thing and another. But the thing that's kind of interesting about these tests that if every tank that we had, including [inaudible], was topped off the night before, you know, to the best of my knowledge, okay? If you go out there the next day at four or 5 o'clock in the morning and the damn thing is sitting there looking at you, how many leakers can you have? I mean, it's insanity to get into this.

I think there's, you know, the whole mechanics of how a tank is actually tested has gotten lost a little bit. That's not a shot at Holly, I'll bet you consider it one, you know, that a tester, and I think Jim said that this morning, a tester knows before he even starts on an overfill method what's the status of that container, because if he goes out there he can't even test the damn thing, so he knew going in what the rules were.

Q: Were-, are you aware of what the protocol is on

the HORNER-1 at present?

A: Yeah.

Q: Do you know when the change was made between 1990 and the present, to the HORNER-1?

A: No. I, I don't know the exact dates, but what I know is that they, they got into a contest, a pissing contest, with it's Gibby or something like that--

Q: The third party?

A: Yeah, the third party. Okay? The off-line standpipe, see, they had, this is where it gets a little complicated, okay? The original standpipe is different than what we're talking about.

Q: When you say original standpipe, what year are you talking about?

A: In the same time period.

Q: 1990, right?

A: They had, you know, once again, if any of you technical guys, you know, have any questions, or you don't agree with me, let's go. But, no. They had a, see, that's what, and I don't think, I talked with them downstairs, I don't think Jim came across really clearly. There's two types of standpipes.

Q: Okay. Explain that.

A: Okay. The Schuster method, and Schuster is, the two of them are involved in all kinds of problems, the Schuster method has a standpipe. Now, who's the expert

A: Sort of.

Q: Okay. What do you mean? I mean--

A: They were hired, the company hired them.

Q: Okay. And they were hired specifically to test tanks, correct?

A: That's correct.

Q: Okay. And why were they not immediately sent to the HORNER school?

A: That's a very good question. And I don't think we got to that. The HORNER, his name is Bill Savage, quit HORNER.

Q: Who was he with HORNER?

A: He was not with HORNER. Nobody's with HORNER.

Q: I thought you said he quit HORNER.

A: No, he was a trainer out here on the West Coast for HORNER.

Q: For HORNER?

A: For HORNER.

Q: When did he quit HORNER?

A: I don't know exactly, but he was not here.

Q: Okay.

A: What I think the point, you asked, do you mind, can I stand up or?

LS: That's okay.

JM: He's got a foot problem.

LS: Go ahead. Sure.