EARTH LAW ALLIANCE

MAY 15, 2018 9:00-11:00

MS. LISA MEAD: So good morning, everyone. My name is Lisa Mead. I'm a director of the Earth Law Alliance and I'm based in Scotland in the UK. Together with my colleague Dr. Michelle Maloney, who is the convener of the Australian Earth Law Alliance we will be making the case for Nature's Rights to the Tribunal.

Our submissions focuses primarily on Question 4 under review by the Tribunal. The question is, What is the extent of responsibility and liability of states and non-state actors, both legal and moral, for violations of the rights of nature related to environmental and climate harm caused by these unconventional oil and gas extractions techniques?

We will argue that under our current environmental laws in which nature is objectified and treated as property to be exploited, in many cases, damage is permitted rather than prevented.

We will argue that unconventional oil and gas extraction violates the rights of nature to exist, to thrive, to regenerate and to evolve. And that both state and non-state actors are responsible, accountable and liable for these violations.

We will also argue that from a climate change perspective alone unconventional oil and gas extraction is an indefensible activity because it exacerbates carbon dioxide emissions at a time when it is imperative that we reduce them thereby violating the rights of all beings to integral health.

We will call various expert witnesses and we will present evidence showing that the rights of the atmosphere, of water, of soil, of rock, of the climate and of countless living beings with whom we share this planet are being violated by unconventional oil and gas extraction.

Given the constraints on our time we are only able to give you a brief glimpse of the kind of harms that are being inflicted on nature, however, we believe that these examples are more than adequate to illustrate the inherent risks of unconventional oil and gas extraction and why it should not continue.

We believe that a shift in our legal system's treatment of nature will help to shift the current paradigm from nature's object to nature as subject of the law.

We envision a legal system in which nature's rights are as vital as human rights and where the two are regarded as complimentary because health and humans

rely on health in nature and in ecosystems.

We will make the case that in spite of our scientific knowledge of the perils of climate change state actors are continuing to enact laws and regulations which authorize unconventional oil and gas extraction for the benefit of non-state actors, that is oil and gas corporations.

We will argue that the responsibility for the damage done lies with state and non-state actors and that they are responsible and, therefore, liable for environmental and climate harm caused by unconventional oil and gas extraction.

Our written submission delivered to the Tribunal on the 30th of March of this year highlights this and also contains further non-exhaustive evidence of the kind of damage to nature that's been occurring.

Ultimately we are asserting that a fundamental reassessment of our relationship with the living body of earth is vital for nature's survival and thus for our own survival.

And now moving to the foundations of our arguments in support of the rights of nature. In considering the rights of nature in relation to climate change and unconventional oil and gas extraction it's important to recognize that there is already recognition

in a number of international instruments that nature has the intrinsic right to exist, thus demonstrating that over the last 40 years our collective thinking in industrialized society has been shifting from a purely anthropocentric and utilitarian perspective to a world view that recognizes nature's intrinsic worth for its own sake.

At present formal international law, that is law created between nation states, does not yet recognize the rights of nature. But legislation and court cases exist around the world recognizing the rights of the natural world. And a large number of civil society agreements and statements advocate for the rights of nature.

We draw on this emerging movement and the statements and laws within it for our submission to the Permanent Peoples' Tribunal. We also draw on the Universal Declaration of the Rights of Mother Earth, abbreviated as the UDRME, which is a powerful civil society statement created and endorsed for more than 30,000 people from more than 100 countries who attended the World Peoples Conference On Climate Change And The Rights Of Mother Earth in Cochamamba, Bolivia in 2010.

As I already mentioned explicit recognition of the rights of nature and of the sacred importance of the

living world has being acknowledged in many international statements and agreements.

For example, in 1982, 111 countries voted to adopt the World Charter For Nature which recognizes that every life form is unique warranting respect regardless of its worth to humans.

The charter recognized that humankind is a part of nature and life depends on the uninterrupted functioning of natural systems.

Prior to that, in 1980, The International Union For The Conservation Of Nature, the ICUN, had recognized that every form of life warrants respect independently of its worth to humans, to people.

Human development should not threaten the integrity of nature or the survival of other species.

And in August 2016 the World Conservation Congress of the ICUN went further and adopted Resolution 100, incorporating the rights of nature as the organizational focal point in ICUNs decision-making. These ICUN resolutions influenced global and national conservation policy.

We also see the growing legal recognition of the need for healthy ecosystems and also the need for human duties to the environment with 140 countries to date, including environmental protection of one kind or

another in their constitutions and 86 of them explicitly recognizing the human right to a healthy environment.

This is a good start but it does not go far enough. And so, in light of the current failure of the international legal system and of so many national legal systems to recognize nature's intrinsic right to exist, our submissions to the PPT therefore draws on the legal principle set out in the Universal Declaration of the Rights of Mother Earth.

And in order to articulate what the rights of nature are we will also reference the growing body of rights of nature and legal personhood laws around the world.

My college, Michelle Maloney, will expand on these freedom rights of nature developments in our session tomorrow afternoon.

So today we've invited a number of expert witnesses to join us in making the case for nature. First we will hear from Cormac Cullinan, author of Wild Law: A Manifesto For Earth Justice, who will talk more about the principles of earth jurisprudence and why fracking is a contravention of the Universal Declaration of the Rights of Mother Earth and what earth jurisprudence means in practice for action on climate change and unconventional oil and gas extraction.

Next we'll hear from Linda Sheehan, senior counsel of the Leonardo DiCaprio Foundation. Linda will look at the co-dependency of human rights and nature's rights and the need for legal change. She'll also look at the big picture of how fracking is exacerbating climate change.

Thereafter we will begin to address some of the substantive violations of nature's rights. First looking at violations of the rights of animals and plants and second violations to water. We will be calling four expert witnesses today to provide testimony on these issues.

So our first presenter, Cormac Cullinan, has been a leading advocate for earth laws and rights of nature for the last 18 years. Cormac is a director of EnAct International, an environmental law and policy consultancy based in South Africa.

Cormac is also an author and a climate justice advocate. His 2002, Wild Law: A Manifesto For Earth Justice, presents a framework for transforming legal systems to align with the laws of nature and is a clarion call for recognizing the rights of nature in law.

In 2010 Cormac was invited to be a lead author for the Universal Declaration of the Rights of Mother

Earth, which is fundamental, as I said, to the case we're making to this Tribunal.

He's been a keynote speaker for the rights of nature at many events, including the 2011 UN Conference On Climate Change in Durbin and the Rio Plus 20 Earth Summit in 2012. And Cormac is an honorary research associate at the University of Capetown.

So with great pleasure over to you, Cormac.

MR. CORMAC CULLINAN: Thank you, Lisa.

My name is Cormac Cullinan and I'm a member of the Executive Committee Of The Global Alliance Of The Rights Nature and have been an active advocate for earth jurisprudence and the rights of nature for about 18-years and I'm based in Capetown.

I've been asked to explain earth jurisprudence and why this philosophy of law and specifically the rights and duties specified in the Universal Declaration of the Rights of Mother Earth are relevant to the Tribunal's hearing on fracking.

Indeed I'll argue that they are more than relevant. That they are fundamental to the decision that the Tribunal is called upon to make in this case.

So, first of all, what is earth jurisprudence?

Earth jurisprudence is a term that I coined to

describe the philosophy of law that is ecocentric as opposed to anthropocentric. In other words, a jurisprudence based on the understanding that the primary purpose of human legal systems must be to ensure that human beings live and behave, not only as good citizens of human communities but as good citizens of the whole earth community.

In other words, for humanity to flourish and, indeed, even to survive we must adapt our behavior to the characteristics and constraints of our environment.

Since law is one of the most important tools of structuring human societies and for regulating human conduct it must follow that laws should be directed towards this fundamental purpose. And I refer to laws which reflect earth jurisprudence as wild laws.

So turning now to give you a clearer idea of what is meant by earth jurisprudence I'll deal with some of the fundamental principles of earth jurisprudence.

Perhaps the first is that the universe itself is the primary law-giver, not human systems. In other words, we are born into an ordered universe and the earth's community, of which we form a part, is constituted and defined by certain fundamental non-negotiable laws or regularities, if you prefer, and relationships.

So these fundamental characteristics of the natural world are referred to as the great jurisprudence. In other words, this is the jurisprudence, if you, like the system of order, the fundamental principles which would inform specific earth jurisprudence developed by different human communities in specific places and times.

Now a failure to adapt our behavior to conform to the preexisting natural order, whether by ignorance or intention, is detrimental. We can see this quite clearly with climate change.

It is quite clear that there is a point beyond which the climate becomes unstable if you carry on putting greenhouse gases into it. In other words, whatever that point is, and there may be some arguments about it, the existence of a certain concentration -- the fact that a certain concentration of greenhouse gases will trigger instability in the climate and move to a very different climate is indisputable and non-negotiable.

If we choose not to recognize that fundamental characteristics of the earth's system then, as we see today, it will be highly detrimental to the human species and, in fact, threatens our survival.

So the important point is that there are

certain laws, if you like, which are original, that predate human laws and with which we must conform because they are non-negotiable.

So flowing from this earth jurisprudence argues the earth's community and all the beings that constitute it have certain fundamental rights, including the right to exist, the right to habitat or a place to be and the right to participate in the evolution of the earth's community. Sometimes this is referred to as the intrinsic rights of nature and ecosystems to exist, to strive, to regenerate and to evolve.

Now this can be explained quite simply as that which comes into being has the right to be. And in fact earth jurisprudence is simply applying the same logic that we use to justify human rights. If we exist by the virtue of the fact that we exist as human beings we claim to have intrinsic human rights and that is the same argument that is being applied to the rights of all that has come into existence.

Of course, as with any rights, these rights are all limited by the rights of others. And so the rights of any particular aspect or member of the earth's community must be limited to the extent necessary to maintain the integrity, balance and health of the communities within which they exist.

In other words, the rights of the whole must take precedences over the rights of constituent parts of it because the flourishing, the ability of any part of the whole to exist will be lost if the whole is degraded.

So human acts or laws that infringe these fundamental rights and which violate these fundamental relationships and principles that constitute the earth community are constantly illegitimate and unlawful from the perspective of earth jurisprudence. They would be equivalent to finding that a government action is unlawful because the official in question was acting beyond his or her powers.

So we say that no member of the earth's community is entitled to act contrary to these fundamental principles which constitute the system of order into which we are born.

So humans must, therefore, adapt their legal, political, economic and social systems to be consistent with the natural system of order and to guide humans to live in accordance with it.

This means that human government systems must, at all times, take account the interests of the whole earth community and must first determine the lawfulness of human conduct by whether or not it strengthens or

weakens the relationships that constitute the earth's community.

So, in this case, we would argue that determining the lawfulness of unconventional means of extracting oil and gas must be evaluated on the basis of whether or not they strengthen or weaken the relationships that constitutes the earth community.

Government systems must maintain a dynamic balance between the rights of humans and those of other members of the earth community on the basis of what is best for the earth as a whole. They must promote restorative justice, which focuses on restoring damaged relationships, rather than punishment or retribution and they must recognize all members of the earth's community as subjects before the law with the right to the protection of the law and to an effective remedy for human acts that violate their fundamental rights.

I would like to turn now to the question of why this Tribunal should apply the rights reflected in the Universal Declaration of the Rights of Mother Earth. There are many reasons but I'll focus on four.

The first is to cure the bias of existing legal systems. If the Tribunal were merely to administer and apply existing international law they would be applying a legal system which is essentially

caustic to the natural world.

By defining all of nature's property we have become blinded to the reality of an animate world. A community of life created by a myriad of relationships. All of those relationships are invisible to the law if we see everything that is not a human being or a corporation as mere property.

So our current legal systems, and particularly the international legal order, are embodied and flawed in a misguidedly anthropocentric view. It is very necessary to correct this and to apply a broader concept of law if one is going to arrive at appropriate conclusions in relation to matters such as this, which concern the relationship between human beings and their environment.

And this is reflected in the preamble to the Universal Declaration of the Rights of Mother Earth which mentions that in an interdependent living community it is not possible to recognize the rights of only human beings without causing an imbalance within mother earth.

So in other words, if one ignores the rights of other beings and applies only existing international law one will be essentially embarking on a bias inquiry. So it's necessary to cure the biased of existing legal

systems.

The second reason for applying this is simply as a matter of logic. Human beings are a branch on the tree of life. It is illogical to simultaneously claim the rights of life, dignity, et cetera, for the human branch while denying the rights of the tree itself to exist and to flourish. It simply doesn't make sense.

And this is also reflected in the Universal Declaration which refers to, in the preamble, affirming that to guarantee human rights it is necessary to recognize and defend the rights of mother earth and all beings in her.

So it is quite clear that logically it makes no sense to pretend to deny the rights of the whole while asserting the rights of a part of it.

The third reason is as a matter of justice or equity. Now balance is fundamental to the concept of justice. We see this in the personifications of justice as a goddess holding scales. And while we place human interests or rights in one hand, and there are no rights of the rest of nature to place in the other hand, there can be no balance and there can be no justice. And we see this reflected in the absence of ecological balance in the world today.

Human beings, by virtue of the fact that human

rights and interests trump all other rights and there are inadequate legal and institutional mechanisms for seeking balance, we have ongoing degradation of the planet which we see around us everywhere.

And the fourth and final reason why this Tribunal must apply this approach is as a matter of necessity or survival. As we all know climate change represents an urgent and unprecedented and eminent threat to almost all forms on life of earth and certaintly to human life.

The idea that, at this stage, opening up new means of exploiting oil and gas, which will accelerate climate change is clearly, in my view, not only a breach of the fundamental rights enumerated in the Universal Declaration of the Rights of Mother Earth but also precipitating and accelerating the crisis we find ourselves in.

So for a tribunal, at this point in human history, to apply laws which do not recognize the rights of nature as a whole would, in my view, be highly irresponsible and inappropriate given the urgent situation that we find ourselves in.

I would just like to briefly mention two other points for the Tribunal to consider.

The first is the question of integral heath

which will be dealt with in other presentations as well. This is a concept which is not well-known in the West but it is a reminder that the health of one part of the whole is derived from the health of the whole and largely dependent on the health of the whole and equally the health of the whole is a function of the health of its constituent parts.

So if we are to assess the health of humanity, for example, and the future prospects of humanity within the context of the earth's community as a whole, we can see that damaging other aspects of the earth's community and the earth itself will inevitably reflect and damage humanity.

So the concept of integral health and the importance of maintaining integral health is fundamental to this approach.

The other point I would like to mention is the question of proportionality. Proportionality is a principle well known in international law and in most legal systems.

It generally involves a weighing of what are the benefits of a particular course of action outweigh the harm. And, essentially, whether they can be justified.

Now in this particular situation it is

necessary to consider whether the benefits which may arise from unconventional means of extracting oil and gas are, in any way, commensurate with the harm that they cause.

In other words, you will hear evidence of the very great harm that these methods will cause not only to human beings but also to the earth itself, the integrity and the structure of the earth to water systems, to the atmosphere, to other species, et cetera. And against that one must weigh the advantages. Can such grievous harm be out-weighed by the advantages or be justified, in any way, by the advantages.

The advantages, it seems to me, if they can be called advantages, lie mainly in the accrual of profits to a very small group of human beings.

So to end it all I would say to this Tribunal that it is extraordinarily important that you base your decisions not only on what is regarded as existing international human rights law but also that you apply the earth jurisprudence approach and look at the rights and duties reflected in the Universal Declaration of the Rights of Mother Earth and at the heart of this inquiry is what is the right relationship between humanity and earth?

Are these practices consistent with

maintaining a relationship of respect and with maintaining integral health of the whole and of humanity and the other members of the earth community?

And my submission is that if the Tribunal approaches this question from that point of view and asks what is the right relationship that ought to be upheld here there is only one possible conclusion.

Thank you.

MS. LISA MEAD: Thank you, Cormac. I just wonder if any of the judges have any questions for Cormac?

No? Okay. Then we'll move on to Linda.

So our next presentation is by Linda Sheehan. Linda is senior counsel at the Leonardo DiCaprio Foundation, or LDF as it's also known, where she manages programs, advances solutions to climate change and provides legal counsel.

Prior to LDF Linda was Executive Director of Earth Law Center where she advocated for nature's rights.

She also ran the California Coast Keeper Alliance and the Pacific Region Office of Ocean Conservancy where she successfully advanced initiatives to benefit inland waterways and the oceans.

And for her efforts in fighting pollution of

the Pacific and the streams and rivers that flow into it Linda was recognized as a California coastal hero.

She holds a B.S. in Chemical Engineering from MIT, a Master of Public Policy from UC Berekley's Goldman's School and a JD from UC Berekely's law school.

So, Linda, over to you please.

MS. LINDA SHEEHAN: Thank you so much. And greetings esteemed members of the Tribunal. I would like to take this opportunity to dive a bit more deeply into what Cormac Cullinan was just discussing right now with some facts, and as I pull up my deck right now I wanted to reiterate that, again, for the record, my name is Linda Sheehan and I am with the Leonardo DiCaprio Foundation and I have been a member of the Global Alliance For The Rights Of Nature and based in the San Francisco Bay Area.

I will leave this deck with Ms. Mead for the tribunal judges but I wanted to provide it so we could look at some additional facts and figures that illustrate what Cormac was just discussing with regards to the significance of considering rights of nature as part of this Tribunal.

So as you just heard we are codependent with the larger system of earth and our relationships with all life are critical. And if we, as humans, assume

that we have inherent rights because we exist so too does nature. And violating human rights also, at the same time, often results in violations of nature's rights and vice versa. And we're seeing this in particular happening with fracking where we see co-violations of human rights, the rights of indigenous people and nature's rights with the same action.

And this is the type of systemic consideration that we need, as a society, to consider in order to be effective in identifying problems and its solutions.

Nature's rights and human rights are codependent as we heard. Decision makers are considering, in a positive way, that human rights are consistent with environmental health and as a result over 100 countries worldwide have adopted laws, constitutional provisions and court decisions that recognize the human rights to a healthy environment.

This is a very positive step but, at the same time, we need to recognize nature's own inherent rights to exist, thrive and evolve.

So, as Cormac discussed, as you heard as well from Ms. Mead earlier, we are asking the Tribunal to consider laws that are grounded in the inherent rights of the natural world. Currently what's happening is that nature is being considered as property. It's a

resource that is being used to accelerate short-term profits and wealth for very few for a dwindling number of people to the harm of the earth and the larger system of life and human populations around the world.

So because humans consider nature to be property in our economic and governing system it's by definition, according to our economic system, degraded. It's used and processed. And it's treated in a way that allows it to be degraded, perhaps more slowly under current environmental laws than it has been in the past, but the trajectory is quite clear.

And because our larger and economic governing systems presume that the human well being is dependent upon seeing nature as property, such as the way the GDP considers nature as an interest of destruction as a positive benefit on our economic system and economic balance sheet, governments will often side with private industry in disputes over natural systems. So this is something which needs to be considered as we're moving forward with how we look at fracking in a larger sense.

So what are the types of challenges that we're facing by not considering nature's rights, and what are the types of strategies that we can see if we do consider violations of nature's rights along with violations of human rights and the rights of indigenous

people as we're considering unconventional oil and gas extraction?

Well, just a couple of quotes from people that have -- hold a lot of respect in the larger community. Scientists, hundreds of scientists from around the world agree that unless we significantly make change then we will see degradation in our very life support systems, irretrievable damage.

And the World Bank, which not many people would say is a bastion of environmental liberalism says, "The dark current status quo is driving our eco system into a state unknown in human experience."

And this is worrying people around the world, not just tribunal judges and folks speaking on the impacts of fracking, but larger decision makers and they're looking for solutions, which is fortunate because we can have a meaningful conversation.

Diving in again a little more deeply into the types of issues that Cormac and Lisa raised, the rights that have been violated, human rights, indigenous peoples rights and natures rights, we can look at these and start to parse these out.

Earth Law Center did two reports on this looking at various types of co-violations around the world of these types of rights and what we're learned

from these types of examinations is that, again, governments are often complicit along with industry or alone that indigenous peoples are vastly over-represented in terms of harm.

That human rights violations we're now seeing include not just displacement such as from climate change but imprisonment and even murder of defenders of the environment. So we can see the larger government system trying to hold control over this idea of nature as property to the detriment of the communities.

Fossil fuel and mining extractions are the types of harm that we're talking about today are representative in well over a quarter, if not more, of these type of co-violations and most of them strongly associated with the type of biodiversity loss that scientists and government decision makers are concerned about.

And this is not something that is isolated to particular parts of the world. Right here in the San Francisco Bay Area just across the bay from where I am right now in Richmond, California, it's the single largest greenhouse emitter in California, which is the Richmond Chevron refinery.

It releases toxins into the atmosphere. Local children suffer asthma at more than double their

national average and, as you can see from this photo, there have been fires and explosions that have sent thousands of people to the hospital with harms that are rarely fully addressed.

So how do we start to think about addressing those co-violations? You know, what to be thinking about in a sensitive and systemic way? What does that do for us in terms of identifying problems and solutions?

And I would put to the Tribunal that by creating governing systems that include both laws and economic systems that respect and fully enforced humans rights and nature's rights consistent with permanent things, larger systems of law with jurisprudence, we will ensure that we do that sustainably and thrive, both humans and all life.

There are different ways that we can consider this and many of these are already being implemented around the world. This is recognized in the inherent rights of nature, in civil society documents such as the Universal Declaration of the Rights of Mother Earth, creating court systems and laws to address rights of nature, providing emergency protections to environmental defenders and building nature's rights into human rights instruments themselves and building human rights and

nature rights into climate agreements, of all of these are legal strategies that we would not have considered if we'd not thought about nature's rights. That they will ensure that we and the earth will thrive together.

So let's just look at a few examples of what this looks like as a practical matter, both with respect to fracking and also the associated impacts of fracking.

So we were talking about unconventional oil and gas extraction of which fracking is one example. And fracking and nature's rights go hand-in-hand. The chemicals used in fracking operations, which you will be hearing more about throughout this week, contaminate the environment in a significant way and not just soil and air and water but as species such as fish that depend on that.

Fracking uses enormous amounts of water and the actual fracking operations cause earthquakes, disrupt river flows, aquifer flows and disrupts other types of ecological productivities that healthy relationships require to thrive.

The fracking operations themselves, of course, release significant amounts of greenhouse gases including methane exacerbating the problems before us.

So we hear that fracking creates clean gas but that only looks at one tiny, tiny slice of a larger

proportionality question that Cormac was raising earlier. And, again, fracking implicates human rights as well. And not just thinking about this human right to health, which this talks about, but also the larger suite of human rights.

Certainly we know that humans are being impacted by toxins and water use that fracking requires. And the UN itself recognizes that the human rights to water, clean water for human basic needs, is essential to the realization of all human rights. We cannot live without clean water. And fracking is directly attacking that.

But it's not just health related issues. Those -- you know, such as those associated with water and asthma related to air pollution. We also see a direct assault on our democratic rights as well.

Communities that have peacefully protested have been met with violence and intimidation and arrest. And locally enacted laws ban fracking because communities realize these harms that are coming their way have been overturned by oil and gas lobbyists in state legislatures such as in Texas.

These are the types of all-out democratic rights assaults that we're seeing happening with fracking. But, again, these need to be considered in a

larger context of how we consider our relationship with nature and if we considered that fracking would be something that we would not let them to be considering as something that is relevant to our engery's future.

Just looking at fracking we talk a lot about the direct impact of fracking and looking at the extraction and the deposit of fracking waste water. But fracking has much larger systemic impacts. And, again, if we're looking more systemically at nature and human relationships then we'll start to more readily see these types of impacts that we have missed. And, again, that will affect the benefit cost to the community equation we were hearing about earlier.

So the fracking boom that is a release of cheap shale gas in the United States and elsewhere is reporting massive new investments in creating plastic. Over 160 billion so far is being spent or planned to be spent on active projects, planned projects, that are going in to the ground. By 2023, just over the next few years, that will lock in plastic production for decades. And, again, this is specifically because of the availability of these sources of fossil fuels.

And, again, stepping back and looking at this larger equation, what are the benefits to the larger system of rights, including human and what the costs?

We know what the costs are and we're learning more about them as we look at these larger systemic problems. The benefits are just to a smaller and smaller number of people.

Nature's rights, of course, in plastics are clearly impacted. We know more each day about the amount of plastic, particularly in the oceans, and that species, birds, sea mammals, sea turtles, consider plastic as food and will starve as a result. Obviously, clearly, impacting their inherent rights.

New research that is coming out shortly is demonstrating that plastic is degrading the environment, including the ocean, and are producing significance levels of greenhouse gases themselves. So yet another source of impact associated with fracking and plastic production that we had not thought about before, greenhouses associated with plastic degradation.

Plastics also breakdown into micro-plastics which phytoplankton and other small creatures are consuming as food as well and it's been found entrapped in arctic ice.

One other point related to microplastics is that they themselves are enhanced in terms of their toxicity because toxin and contaminants in the ocean readily attach themselves to the microplastic and the

particles where they become even more contaminated food for organisms.

Plastic also affect human rights. We know that seafood eaters are consuming thousands of pieces of plastic annually. The plastic is regularly found in seafood and it's not just in the UK. There's been studies in California that show a significant amount of plastic in seafood that are caught in inland fish that are caught and eaten by people.

European officials are calling for a significant amount of research on this as well as research into the impact of plastics in drinking water, both tap water and particularly bottled water, which people think of as safer which it, in fact, is not.

The plastics are also now being found in soils and we're looking at the impact of that on plant production. And, of course, we know a significant amount of interference with certain plastics with reproductive hormones.

So these larger problems are being generated and exacerbated by what is considered to be cheap oil and gas created by fracking. And now as we look at these larger impacts on nature and the effects that nature and humans have together because we are codependent we're seeing that this cost-benefits

equation is vastly incorrect.

That we need to look at the more holistic picture and have a better sense of how we want to be able to move forward in a way that is safe and healthy for communities, both human and natural communities around the world, and allow for resilience and flourishing.

So if we want, as many of our colleagues want, a plastic free thriving future for people and planet we need to transition away from these types of unconventional oil and gas extraction techniques that are supporting even more plastic production.

And these examples that are just the tip of the iceberg they illustrate, again, that earth rights must be fundamental to any solutions that we look at.

And I put to the Tribunal that without considering nature's rights we miss a significant amount of this analysis and the resulting conclusions that we have will be altered and flawed. So I encourage you to consider that we must protect human rights by also protecting and safeguarding the rights of earth.

Thank you. And I welcome any questions that you may have.

MS. LINDA MEAD: Thank you, Linda.

There are no questions then we'll move on.

But thank you for that illuminating talk, Linda. I very much appreciate you joining us.

So next we move on to look at the some of the evidence that harms are occurring to animals as a result of unconventional oil and gas extractions.

We have two witnesses providing testimony on this and I would like to call the first of these two witnesses, Dr. Michelle Bamberger, who is a vet and researcher.

Over the last eight years Dr. Bamberger has been investigating the links between unconventional fossil fuel extraction and animal and human health. Doctor Bamberger received her Doctor of Veterinary Medicine from Cornell University and a Master's in Pharmacology from Hahnemann University Medical College.

She serves on the advisory board of Physicians Scientists And Engineers For Healthy Energy and is co-author of the book The Real Cost Of Fracking: How America's Shale Gas Boom Is Threatening Our Families, Pets And Foods.

Doctor Bamberger and Dr. Robert Oswald have also conducted two independent peer reviewed studies looking at animal and human health and how it is impacted by living in close proximity to fracked wells.

I'll provide the titles and references for

these and other papers we refer today to the Tribunal judges in a separate document and Dr. Bamberger will describe the scope and findings of these studies for you now.

So over to you Michelle.

DR. MICHELLE BAMBERGER: Thank you, Lisa.

So I'll just repeat. My name is Michelle Bamberger and I am a veterinarian in Ithaca, New York. I have been studying the health impact of fossil fuel extraction with my co-author and husband Robert Oswald, since 2010. We started doing this after several high profile livestock cases were not reported in the scientific literature.

Our first case report study, Impacts Of Gas Drilling On Human And Animal Health, was published in 2012 in New Solutions. The question we asked in our first study was, Does unconventional oil and gas extraction cause health impacts?

We wanted to include livestock and companion animals because we thought they might be acting as sentinels due to their higher rates of breeding, shorter generation times and higher exposure.

We had 24 cases from six states. Those states were Pennsylvania, New York, Ohio, Louisiana, Texas and Colorado. And most of those cases came from

Pennsylvania.

We had nine food animal cases, 12 companion animal cases and three wildlife cases. Eighteen of these cases were unconventional wells. Seven of those were conventional and one of the cases we had had both conventional and unconventional wells on their property.

For each case we collected drilling information which included locations of nearby gas and injection wells, impoundments, compressor stations, pipelines, processing stations and dates of drilling, completion, production and processing.

We also collected air, soil and water testing results and we also looked at the veterinary and human health records for everyone involved in this each case. From this information we made a timeline of events for each case and from that timeline we identified roots of exposure and commonly reported medical problems.

Our second case reports study, Long Term Impacts Of Unconventional Drilling Operations On Human And Animal Health was publish in 2015.

The questions we asked in our second study were, Do health impacts change over time and does location matter?

We followed these cases over time because of low dose and long term health effects of many of the

chemicals associated with unconventional extraction, especially those chemicals known as endocrine disruptors and immune suppressants.

The cases were sorted by industrial activities compared to activity at the time of the original interview. We had 21 cases at this time from five states, Pennsylvania, New York, Colorado, Arkansas and North Dakota. Seven of these cases were food animals, 11 were companion animals and three were wildlife. Eighteen of the cases were unconventional and which had 17 gas and we had one tight oil. We had two cases with shallow vertical gas wells and two cases with deep vertical gas wells. The follow-up period for this study was 25- months.

In our first study we found that the major health impacts to food and companion animals was in the area of reproduction. Mostly what we saw were failure to breed, abortions, still births and failure to cycle. We found that humans were mostly impacted by burning eyes, nose and throat, headaches, GI problems, nose bleeds and rashes.

We had natural control and experimental groups in cases where farmers kept part of the herd on one pasture and the rest on another pasture.

One case I'd like to mention is where a part

of the herd was exposed when the liner of a waste water impoundment was allegedly slit and the fluid drained into the pasture and the pond that was used as a source of water for the cows.

Of those exposed to the waste water some died and there was a high incident of stillborn and stunted calves. The remainder of the herd were held in another pasture and did not have access to the waste water. They showed no health or growth problems.

In another case part of a herd was exposed to a creek into which waste water was allegedly dumped with the remaining cattle kept in other pastures without access to the creek. Of the cattle that were exposed to the creek water approximately one-third died and approximately one quarter failed to breed. Of the cattle that were not exposed there were no unusual health problems and only one cow failed to breed.

In our second study we had nine of 21 cases where drilling operations were currently decreased compared to activity at the time of the original interview. In eight of nine of these cases all health impacts associated with the start of drilling operations decreased in owners and their animals.

In areas where activity either remained the same or increased there were no significant differences

in health impacts except in one case. It was a case where a woman bred dogs as well as horses and the health impacts in the animals more than doubled.

In cases where people moved away from industrialized areas all symptoms that had previously been associated with the start of drilling operations decreased in both the owners and the animals they brought with them.

The main routes for exposure are ingestion and inhalation. Ingestion exposure occurs when ground water or surface water becomes contaminated and when fracking, drilling and waste water fluids spill.

Inhalation exposure occurs when chemicals released during extraction, processing, production, distribution and frack sand mining as well became airborne.

Exposure to contaminated feed stuffs and food products may potentially occur because most of unconventional extraction happens in agricultural areas and food animals may be concentrating toxicants in meat, milk and additives.

I believe that the biggest health risk to animals posed by unconventional oil and gas extraction is exposure to chemical toxicants in the air and water that impact both the reproductive and respiratory

systems.

I do not believe that the impacts of unconventional oil and gas extraction can be eliminated due to three major reasons.

The first reason is that the nature of the process is very complex and it involves many chemicals and risky procedures and has been reported already that they contaminate air, water and soil.

The second reason is that non-disclosure agreements prevent health researchers, like myself and my husband, from finding out exactly what happened.

And the third reason is perhaps maybe the most important of all is that chemical testing should include all substances used in the drilling process as well as all substances expected to be brought to the surface with the gas. The problem is that traditional chemical testing has serious limitations.

So what are these limitations? The first one is that the chemicals must first be identified and then test developed for analysis. That sounds like a simple thing to do but it is very difficult to develop a test to analyze some of these chemicals.

The second thing is that detection levels are often above concentrations that are active in the body.

Third reason is we don't know the safe

concentration for most chemicals. We don't know the effect of mixtures of chemicals and the levels of contamination are not stable. We found this ourselves with some testing that we've done with air and water where we've gone and measured air and water levels of chemicals. Gone back a year later and did it again and was vastly different. And often times it doesn't correlate with the amount of activity in the area. So these things are very fluid.

I believe that unconventional oil and gas extraction should be banned because it is an uncontrolled health experiment on an enormous scale and even if it were completely safe and risk free fossil fuel should be kept in the ground because of climate change.

Thank you.

MS. LISA MEAD: Thank you, Michelle.

Do any of the judges have question for Michelle?

Michelle, I just wanted to ask you. So when we spoke last week you talked about animal or feed and how there was a problem with feed. And I would love it if you would explain that, how fracking impacts upon the feed.

DR. MICHELLE MALONEY: Yeah. Sure.

I think to get a real understanding of that you almost have to be out in the field. So many people and not just those who are up here in New York in the southern part of the state, but just cross the border and where you are and that is absolutely true. So that was part of our education ourselves is to go and see it.

And I was shocked to see that the cows were grazing around well pads. The crops are planted around these waste water or production water systems.

And I'll never forget the one we visited in Pennsylvania where the vent was actually opened and it should not have been completely open like it was. And it was obviously venting in the air. It was the sort of air you could see where you could see the chemicals.

I don't know if you've ever seen that as a backdrop. I guess they get defracked sometimes. And there was the corn and squash all around.

And the person that was involved on that case I specifically asked her about those crops and where they were sold. And she said, you know, that's interesting about those crops is that they're considered organic.

And that gives us another -- that is another whole lecture is how that the organic certifiers are

really not touching fracking issues. Not touching whether it's -- you've got fracking next door to you or not. They're really concerned about the pesticides and that sort of thing but when it comes to fracking right now, to the best of my knowledge, it's not out there.

So as I was telling you, Lisa, last week as far as proving this specifically these tests are probably the most expensive to do because we are looking at analysis of the chemical toxin in the animal tissues themselves and then we are talking about transferring them.

And also how do the crops gets contaminated? How does it go back into the animals?

These tests are expensive so, to the best of my knowledge, no one has done this sort of testing that should be done. And that's why I said the word potentially.

But once you would see that you would want to know where those crops were sold because you would want to avoid those crops. You would not want your children or anyone to eat anything coming out of those area. And, unfortunately, that's where most of the fracking is occurring in agricultural areas.

MS. LISA MEAD: Thank you.

And I had to step away for like one minute but

I would like for to you explain the example of the herd that had -- it was like half of the herd was exposed to fracking water or some kind of toxic --

DR. MICHELLE MALONEY: There were two cases that I talked about, Lisa. First there were more.

What I said initially was that there were several cases that got us involved and one of those cases actually is we could look at a split herd.

The herd was in the pasture but because of where the exposure occurred only part of the herd was exposed. And so that was the most dramatic case that we've had.

And that case happened in April 2009 in Louisiana. And that was the case that probably everyone will remember once I say this but 17 out of a herd of 40 beef cattle died within a hour after exposure to fracked fluid.

This was a mistake on the part of the company. They were filling or doing something with the fracked fluid. It leaked out in to the pasture ground, under the fence, the cows started drinking it and within a hour almost half of herd was dead.

So, you know, that was a real dramatic case. The rest of the herd that wasn't exposed, again to the best of my knowledge, was fine. But, again, that was

the most dramatic.

The other cases that I did mention, Lisa, when you stepped away one was the case -- they were both waste water related -- one was a case where there was major reproductive problems. The other was a case where a death and also a failure to breed. It was reproduction there too.

The first case was also stunting and failure to thrive. I didn't mention that as a problem. Reproduction was, by far, the major one but also was stunting and growth problems in livestock.

MS. LISA MEAD: Thank you for explaining that. And, as I said, I will make these research papers available to the judges. And I really recommend that you look at the depth in which Michelle and her husband have gone from putting together the research.

So we should move on to our next witness. And this is a video testimony relating to the impacts on animals and plants. And it's by Dr. David Paul interviewed by Michelle Maloney just in the last few days.

Doctor Paul is a senior lecturer and post-graduate research coordinator in the School of Physical Environmental and Mathematical Sciences at the University of New South Wales in Australia. His

research interests range from bio-geography, wildlife ecology and geomorphology through to remote sensing and geographical information systems or GIS as it's also known.

Doctor Paul is actively involved in research on threatened species with a particular focus on medium-sized ground dwelling mammals. His other current and recent research projects include monitoring environmental impacts and geomorphic processes using remote sensing and GIS.

So if I share my screen I'll be able to play this video for you.

DR. MICHELLE MALONEY: Hello, David Paul. Thank you for joining us at the Permanent Peoples' Tribunal.

Can you please tell the tribunal your name, your profession and qualifications and any organizational affiliations that you have?

A. My name is David Paul. I have a research master's degree from the University of New England. I've spent my professional career working for different sectors, including industry and government and community, in relation to environmental assessment and impact assessment issues on biodiversity.

And I'm, currently for the last few years,

I've mainly focused on assisting communities, informing them about how they can have their voices in terms of resisting unwanted fossil fuels projects in their areas.

Most of my work has been in New South Wales or Queensland is another area where I've worked extensively.

Q. And do you work for a university or do you have your own consulting business?

A. I have my own consulting business. Currently it's called Ethical Ecology and all work I do is for communities.

Q. Thank you. David.

So you mentioned that the work you do is in New South Wales and Queensland. That's two states within Australia. Can you talk a little about the research you've carried out regarding the impacts of unconventional oil and gas extraction on plants and animals in those jurisdictions?

A. So I have spent much of -- in my professional career gathering data and analyzing data and working out how to best manage lifestyle impacts such as coal and gas but I think -- felt that mine -- I could do better for the community by being outside that circle because of the limitations that were being placed on professionals working in that sector.

So what I found is that what we don't know is more than what we know. And this is a scary thing. So there has been research undertaken, for example, on the impact of air pollution such a volatile organic compounds and other foreign particle matter on agricultural systems and on human health but there hasn't really been any kind of assessment or that kind of thing on native fauna and flora. So that's the really the big question mark.

Q. In what way is the leaking methane or other gases affecting aquatic systems? Can you give some examples?

A. So what we see in the Condamine River, and this was first noticed years ago, was bubbling methane. Now there has been some controversy about the origin of that methane but it's obvious that it didn't start happening until the coal industry, the coal seam gas industry, was well established in the area.

It's a bit of coincidence that we have very intrusive impacts on ground water aquifers and then -- and then to see the effects on the river. Now they've only gotten worse and apparently the bubbling is spreading to the other parts of that particular system. The Condamine area is very heavily impacted, obviously, of the Queensland mining industry.

Q. And given that the Condamine River flows through very arid areas footage has been seen and shown in other places that the methane has been able to catch fire.

What kind of impact do you think that has on local plants and animals that rely on water or coming to the water hole to drink?

Have you guys had, in your research, any sort of specific examples of plants or animals affected by this gas?

A. As I said there hasn't been any studies, direct studies, done on the impacts of the effect methane contamination has on native animals.

So this is what I'm saying really is my message to the Tribunal is that we don't know what we're doing and we've given approval for all these things to occur and impacts of widespread significance. Well over a million hectares of land is now affected and just in that Surat Basin alone just in the photo area that we looked at. But that is not including the Bowen Basin and that's not including areas in South Wales and the Northern Territory where the plants grow.

Q. There's one basin, the Surat Basin affected by a million acres you said is affected by coal seam gas development.

A. Hectares. Hectares.

Q. That is under research now?

A. So when I say a million hectares I mean the size of the tenements. And actually they're allowed to go anywhere inside those tenements except international parks. So any -- [indiscernible] because they seem to like to -- seems like the pattern for development has been in the remnant of woodland and bush areas first even if they are forest, state forest, which is public land, they are allowed to go there first where the community sort of impact is less and then spread out on across the landscape and they're playing for the same team sometimes.

But what I have found out is that the impacts on biodiversity are also significant. So we've not only had the ground water we've the got surface water and we've got the terrestrial biodiversity is being impacted as well.

Now the big oil belt in Queensland is one of the most over-affected bioregions as a hot spot of biodiversity because of past activity and clearing. And now we have issues with ongoing drought and climate change.

You know, we shouldn't be clearing more country in this bioregion if at all possible. And what

I noticed in some of what they're doing, the fracking in the remnant areas, they're fragmenting, they're reducing the resilience of those areas. They're opening them up to feral predators and then they're also removing little small patches of endangered bushland. And they're removing them because once they're around certain size limits then they don't appear to matter any more according to our government authorizes.

Q. So now we're talking very specifically about the impact of the developments as the gas industry becomes viable in a place. Can you talk about that?

When you say they're opening up areas of land and they're decreasing biodiversity connectivity can you talk very specifically when they come into an area do they cut down trees, do they clear the spaces for their oil drilling pads or can you be specific about their impact.

Q. Well, the main impacts are the infrastructure development of pipelines, roadways, connecting road ways, particularly through bushland and the well pads built. And then we have the processing plants. We have the water treatment facilities. We have other small water wells and things like that and so the overall impact.

So say you've got a field of like a thousand

wells, for example, that's a huge -- that's a huge area of impact and what they haven't considered is the indirect impact. And this industry this is where the whole thing is falling down in terms of impact assessment because they just haven't been able to really adequately account for indirect impact.

So the industry likes to say our direct impacts are so small but they're not really taking into account the indirect impacts.

And the way that our consent authorizes have constructed the approvals they're not really required to take into account indirect impact to any significant degree.

Now these include air pollution, they include off-site water pollution, they include on-site water pollution, light pollution. Noise goes on all night at each of the well -- each of the well pads. At each of the plants they generate a huge amount of noise.

The light pollution is important. If we have light at night that interferes with how animals and plants undertake their kind of behavioral patterns.

Q. Particularly our Australian mammals are nocturnal. We have entire swathes in our country that's being affected by light and noise that would -- you know, you would think someone could look into the

evidence of interruption to species activity.

A. Absolutely no account of any of this is taken into account. And also we have impacts from feral predators and weed invasion.

And why do I say that?

Because when they go into these random bush-land areas and they're putting like a network of roads and tracks connecting well sites everywhere that's increasing -- actually effectively what you're doing is increasing your actual area that the feral predator is able to more effectively hunting.

Q. In Australia what animals are you talking about with feral predators?

A. Foxes and cats mostly.

Q. Yeah. Thank you. And we're almost out of time. Just one last question.

You stressed very clearly that this area, the impact on native plants and animals, is very much under-researched. Are you aware of any initiatives in Australia to change that situation to require greater baseline studies or environmental impact assessments or anything else that might actually show us what's happening to our precious plants and animals through there industrial process?

A. Well no. And that's where the industry has

fallen down because they haven't really taken into account the big picture. You know what I mean?

It's all each project's on its own. And the cumulative impact, you know, we've let go but Cryo, to their credit, in 2016 did look at the impact of coal seam gas and did lament about the lack of information that was on the table for industry to go ahead particularly in the Brigalow Belt region.

Q. The Australian government funded scientific organization in 2016 has a report stating that significant research still needs to be taking place. We might get a copy of that report for the Tribunal.

And we'll have to wrap up now but thank you so much for your time, David, and for explaining that basically this industry's impact on plants and animals is underresearched, is not understood, but is already showing signs, particularly through bubbling methane, in rivers of having an impact.

So thank you very much, David.

MS. LISA MEAD: Okay. So we'll move on to look at impacts on water more specifically.

And just to say the reason Michelle can't join us or interviewees can't join us today is because it's about 3:00 a.m. in Australia and Brisbane right now so it's a little bit harsh. So these are recorded

interviews.

The next witness for violation of water is Gavin Mudd. Gavin Mudd is an Associate Professor in the Department Of Environmental Engineering at RMIT University in Australia.

He was awarded a Ph.D. in Environmental Engineering in 2001 from the Victoria University of technology. Gavin's research interests include environmental impacts, management mine wastes, acid mine drainage, sustainability frameworks, life-cycle assessment modeling and mine rehabilitation.

In 2007 Gavin Mudd completed a report on Australia's mining industry entitled The Sustainability Of Mining In Australia. Key Production Trends And Their Environmental Implications For The Future.

So this is, as I say, also a recording. I will share my screen again and play the video for you.

DR. MICHELLE MALONEY: Gavin Mudd, thank you so much for joining us.

Can you please tell the Tribunal your name, profession, organization and where you're based?

A. My name is Associate Professor Gavin Mudd. I'm based at RMIT University here in Melbourne, Australia and I specialize in environmental engineering and I'm also chair of the Mineral Policy Institute as

well, a NGO that worked on mining issues.

Q. Thank you. Can you please outline the research that you've been carrying out regarding the impacts of unconventional oil and gas expansion on waterways and ground water?

A. The research we've also been doing, I guess, is really looking into what are the key trends and what's the regulation around activities, not just coal seam gas in particular.

And so what do we know, what we don't know, where is the facts, where is the subject claims and actually what is the evidence really showing us? And often what is the lack of evidence stopping us from actually understanding?

So that's where a lot of our research has been focused and I guess it's actually showing that, yes, we can certainly explain the impacts in the Surat Basin on things like ground water systems such as the aquifers that farmers use but also the Condamine River and because of the connection between ground water and surface water that the impacts that coal seam gas have on ground water is translating to impacts on farmers fields and methane gas bubbling up through the Condamine River.

So you can certainly explain CSG is a very

plausible and I think the most likely explanation of those impacts.

Q. So if you were to summarize some of the key findings of your research can you give us an overview of what you're finding, the impacts of gas extraction are on the ground water and surface water?

A. I think that one of the things that I think I still find most stunning from the research work that we've done is that we're not even monitoring for methane in the coal seam gas fields in Queensland.

Now if you're mining uranium you mine for uranium. If you're operating a gold mine, of course, you're watching for cyanide because cyanide is one of the chemicals you use to extract gold.

So if you're operating an airport you're extremely concerned about wind strength and direction and plane safety and pilot training and so on. There is a lots of things you just take for granted because that's how you make an industry or a sector safe.

So when you look at coal seam gas I find it stunning that one of the things that we've shown in our research and done from a master's student of mine and his thesis -- he graduated a few years ago now -- has shown is that they're still not monitoring methane. They're not even required to monitor methane.

And even during the environmental impact assessment process where projects were seeking approval the extent of methane studies in all of those reports is extraordinarily infinitesimally small. And so what that means is that we don't have the scientific data to properly answer these questions thoroughly. And so we're left with some of this piecemeal picture and so on.

So it's a real problem. It's a huge gap. I think that it's something that's poorly appreciated.

The other thing I guess we found is that when you do look at some of the available data just on the ground water levels and looking at the trends in ground water and so on is that, yes, you can actually understand that there are very big impacts. And when you're looking at the volumes of CSG water that are now extracted to extract that gas, the volumes of water often far exceed, like 10-fold or more, the amount of licensed extraction that some farmers have.

So when you're looking at the impact on groundwater if you've got one industry taking 10 times more than another industry the odds of probability suggest that it's the bigger industry that is probably causing the greater impacts on ground water.

So I think there's still a long way to go to

actually get government and industry to properly monitoring the way that would be scientifically reasonable.

So lots of bubbles and lots of aquifer in lots of places sampled frequently and so that way we can start to get a proper picture of what's really going on. And I think the more and more we do that I think the sharper and sharper our understanding will be of the impacts of the coal seam gas, for example.

Q. So in terms of methane fugitive emissions and other activities can you talk more specifically about your concerns?

Is it the quality of water or are you concerned more about the fact that we hear that water levels are dropping in bores and other ground water supplies?

Can you talk about some of the specific impacts [indiscernible]?

A. For coal seam gas there's probably a few different impacts that we really need to be concerned about. One is the sheer volume of water that is extracted and everything that's in that water, whether that be salts, heavy metals or radionuclides or organics such as petroleum hydrocarbons that are derived from the coal and so on. So water quality is a big issue,

obviously, with extracted water from coal seam gas activity.

And then how you manage that water on the surface and the rate. And then the superstructures that you need to contain all that water and force treatment and then use or disposal or discharge of the environmental or whatever is actually done on that particular site. So water quality is a big issue.

The other one is that drop in groundwater pressure by extracting all of that water means that you're mobilizing methane. And so you're mobilizing methane on a geological scale effectively now in the Surat Basin in Queensland. And that methane will find the easiest pathway to get to the surface. That pathway may be a farmer's bore. It may be an old coal exploration bore that hasn't sealed properly. It may also be a fracture zone or a fault line.

And if that fracture zone or a fault line leaks to something like the Condamine River of course you get bubbling in the Condamine River.

So, to me, I think it's quite plausible and I think actually quite probable that the impacts we're seeing on the Condamine and on our farmers and so on in this massive rise in methane emissions coming through the system are causally related to what's happening with

CSG.

So now we need to account for that. And the fact we're not monitoring for methane means we're not accounting for it properly. We're just do a very coarse assessment and the studies that are being done do not answer these questions anywhere near to the scientific rigor that we need. So I think that, to me, is a really big issue.

And then, of course, the other thing that falls within all of that farmers are losing their bores. And so that's something that needs to be accounted for. And so to make good provisions don't really work when the same aquifer are all being impacted. So you replace one damaged aquifer with the next one and that's damaged too.

So even though legally companies are required to make good there are problems in how they actually work in practice because it's just not that easy. So you've got a system that's damaged and it's problematic.

Q. That actually leads very well into the next question which is do you think the impacts of fracking or unconventional gas extraction of our waterways and groundwater can be negated or eliminated in the industry?

A. Well, I think if you look at what we do in

other areas like the science industry that deal with contaminated petro stations sites and groundwater, defense sites, chemicals sites, even old mining sites, where we have to go in and work out how to remediate to clean up.

There's a lot of technology out there that can do this but it hinges on having really good data on the extent of the contamination. Someone has to pay for this. And the fact that we're actually prepared to address that and so on.

Now some of the risk of coal seam gas we don't know if we can really reverse this very easily or not. And we look at the efforts we've gone to in the systems like the Great Artesian Basin where it's taken decades to reverse some of that pressure decline. We wonder -- it's not going to be easy.

If these impacts continue, with coal seam gas in particular, one wonders how you can reverse not only just a pressure declined but also decline water quality and the methane mobilization, if you will. That's the big issue.

Now with respect to shale gas the impact will mainly revolve around well integrity, so making sure the wells are constructed properly and sealed properly and so on.

And then the other big issue with shale gas is, of course, the reinjection of the waste water. So that has been shown, in some places, to be a significant cause of earthquake risk, especially in Oklahoma.

So in that way we can change our practices and we can improve our design and so on but at the end of the day we have to compare those sorts of risk with the same risks for delivering energy or peak services, et cetera, that gas delivers such as -- or electricity, I guess, is the main use of that gas.

And so how does your release of energy compare to that? I think, in my mind, when you look at all of the technical studies that are out there that compare renewable energy to fracking or the shale gas or the extraction of methane from coal seam gas, renewable energy wins hands down every time.

Q. My final question is, in your opinion, given our current understanding of the impacts of the gas industry, do you think it should be banned in any jurisdictions in Australia or elsewhere?

A. Absolutely. I think there is quite a justifiable case that it should be banned on multiple grounds.

One is the environmental risk to the ground water and surface water but primarily it's actually the

main risk revolves around climate change. And we know from a climate change point of view that for every dollar we're investing in fossil fuels that's a dollar that we're not investing in renewables.

And so if we're really about dealing with issues around climate change then investing more in fossil fuels, whether it's shale gas, coal seam gas, underground coal gasification or whatever, don't address that at all.

So I think that there's multiple grounds on which we can say, justifiably say, there is a strong case to ban fracking and coal seam gas but, unfortunately, that's not what our government or industry leaders are delivering us. So we have to look at how else we get there.

Now the great hope that I have is if you're looking at where renewable energy is going it's becoming incredibly cheap and it works. We add battery storage into the system and we solve this intermittency problem.

We're seeing all of that technology roll out now. And not just rolled out on a boutique scale but on a large scale.

And so I think, in that way, that that is something a source of great hope is that we know what the solution is. We need to start, you know, continuing

the investment in that and make sure that that's our future direction and not a backwards step into more fossil fuels.

DR. MICHELLE MALONEY: That's very good. Thank you very much. And that's all we have time for.

So, Gavin, thank you so much for joining us.

DR. GAVIN MUDD: My pleasure.

MS. LISA MEAD: So even though they were not physically present today I would like to thank Gavin Mudd and Dr. David Paul for taking the time to provide testimony to the tribunal.

And I would like to move on to our last witness for today. We're shifting tack slightly to look at how one community in the USA has used rights of nature principles to try to protect their community's water sources from unconventional oil and gas extraction.

So I would like to introduce you to John Olivas. John is based in Mora County, New Mexico. He owns a hunting and fishing outfitters and also works for the New Mexico Wilderness Alliance, a conservation organization that aims to protect public land in New Mexico.

In 2013, while John was an elected official, Mora County became the first county in the USA to pass a

local ordinance that essentially prohibited all mineral extraction in their county. It's title was the Mora County Community Water Rights And Local Self-Government Ordinance.

Ultimately this ordinance was deemed invalid on various grounds by a federal judge sitting in the U.S. District Court for New Mexico, however, Mora County's stance has had a galvanizing impact for other local communities in the USA that subsequently adopted rights of nature ordinances into their local laws in an attempt to stop unconventional oil and gas extraction in their localities as John will explain.

So over to you, John.

MR. JOHN OLIVAS: Thank you, Lisa.

Yeah, hi, my name is John Olivas. I am the former chairman of the Mora County Commission here in north central New Mexico. We took the stand of the rights of nature, an ordinance that banned oil and gas extraction here in our community.

When I was elected into this position there were actually three things that we could have chose to do around oil and gas coming into our community.

The first thing that we could have done was do nothing and let oil and gas come into our community and regulate themselves.

The second thing that we could have done is we could have regulated oil and gas and allowed them to come into our community and, you know, contaminate water, air, the environment to a certain degree under certain regulations.

The third thing that we could have chose to do was ban oil and gas within our community. And that was the stance that we took back in 2013.

A group of community members went ahead and drafted a community rights ordinance that instilled the rights of nature behind it. So what we did is we went ahead and drafted the ordinance. And the whole purpose of the ordinance was to protect our ground water and our surface water within our community.

Mora County here in north central New Mexico is an agricultural based community. So water is precious. We are in the dessert southwest of the United States and water is a precious commodity. So when you have industry who is coming into your community and they're potentially threatening those sources there had to be something done within our community.

What happened within the ordinance is oil and gas came into our community. I think like Michelle had mentioned earlier is oil and gas industry comes into rural agricultural based communities and they begin to

do their research.

Within Mora County back in 2006-2007 time frame what they ended up doing is they ended up doing all the research within our courthouse, our county assessor's office and our county clerk's office and they identified all the many property rights owners and those individuals who owned mineral rights within our community.

And what they ended up doing is they ended up leasing 140,000 acres of mineral rights within Mora County.

What problems that I think we, as a community had with that was that oil and gas negotiated across the kitchen table with these individuals and what they ended doing is they ended up leasing these properties for 25 cents to a dollar an acre.

So you figure 140,000 acres were leased at that rate and the idea of fracking coming into our community having an impact on our water source was a big deal.

So when we went ahead and went through the Community Rights Ordinance pollution was a main factor. There are some wells within our communities here in Mora County that have actually gone dry over the year for uses. So when you have the fracking industry coming in

and putting wells through the system and depleting some of the aquifers it was a huge impact to our community.

The problem that we had with industry coming into these communities was they tend to have a proprietary mix of chemicals that go into these well injections and they do not tell you what is in this mix, this proprietary mix of chemicals that go into your aquifer. So they go ahead and do a fracking technique and when they go ahead and inject the wells there's roughly about 10% of the injection is these chemicals that go into the system.

When they go ahead and do their fracking technique they go ahead and extract a lot of this waste. A lot of this waste is then taken out and it's being on the surface. Some it is being reinjected into retired wells that are within our community.

So when you have an impact to, you know, water, clean air, our environment our landscape those were some of the biggest issues that we had on the rights of nature.

We also have here in northern New Mexico our valley sits in a major water shed. We are here, in northern New Mexico, one of the major -- actually one of the first users of waters in north central New Mexico. We're surrounded by a wilderness area and we

are the first users of this water. So we have industry that's coming in and having some impact to the -- to the water. We will go ahead and, you know, stand up and have those impacts.

On the Community Rights Ordinance that we passed, if you date back to 2013 when it was first initiated, we were one of the first communities, as Lisa had mentioned, to ban oil and gas here in the United States. So we went ahead and banned oil and gas.

We were the impetus for other communities across the country who were able to move in a similar direction. We have states like New York, Maryland who actually have, on a state level, has went ahead and banned oil and gas within the their borders.

We did it at a county level and it was a major, major deal for industry. When we went ahead and passed our Community Rights Ordinance we went ahead and put this ordinance on the books. This ordinance was a game changer for the oil and gas industry.

The oil and gas industry, as soon as they found out that we'd put the ordinance on the books, they went ahead and came after us. They went ahead and filed a couple of federal lawsuits against the county. We went ahead and fought these, the industry, within the federal district court.

So the problem that we had in our communities was the social impacts that they had to our communities, the infrastructure.

Mora County was a community that is pretty poverty stricken. We do have an agricultural based community. Here in the United States we were ranked as probably one of the third poorest counties in the entire country. So when Mora County went ahead and stood up to oil and gas what we ended up doing was setting a precedent that oil and gas did not want on the books so that it was a game changer for industry.

So we went ahead and did something that no other community was able to do. We went ahead and went through the whole federal court system and it was ruled invalid, as Lisa had mentioned, so we went ahead and went through this process, currently, because our ordinance was ruled invalid and it was repealed by another -- a following commission they went ahead and are instituting a regulatory ordinance.

But what's going on within the oil and gas industry? Because the price of oil and gas is not profitable for the community. As soon as the commodity price for oil and gas is profitable oil and gas is going to come into communities.

There are several communities, counties within

New Mexico, that have regulated oil and gas. And it's just a matter of time before oil and gas comes into these communities when they're profitable to do so.

If the judges have any questions in regards to what we we've done here in northern New Mexico you could go ahead and pose any questions.

MR. GILL BOEHRINGER: Yes. Gill Boehringer.

I must say I'm impressed and I'm thrilled to hear the way you approached the industry and resisted the greed of the companies. As a legal academic I'm particularly interested in the process whereby the ordinance was found invalid.

You said you went through the legal system, the federal courts and then you -- well, can you explain what the court said? Why was it invalid?

MR. JOHN OLIVAS: What they ended up doing is they ended up suing Mora County based on the 1st, 5th and 14th Amendment of the Constitution.

So what they did is within our ordinance we went ahead and declared that corporations were not people. That was one of the issues that we had.

The second component that we had within the ordinance is that, you know, myself as an elected official I knew I wasn't going to be there for the long

term so what we ended up doing is we ended up putting a section within the ordinance that stated if the ordinance was going to be repealed it had to have a unanimous vote by the three commissioners that we have within our country and it had to pass 2/3rds vote by the people through referendum.

The State of New Mexico what they ended up doing is because we're not an incorporated community they were going to sue us if we were going to put this on the ballot.

I was voted by the people and I beat an incumbent to get into my election and when the secretary of state mentioned that we could not put this referendum on the ballot it just made no sense because there's three commissioners who actually set policy for the county and having a referendum on the ballot to let the people choose if oil and gas was going to come in or not was the issue.

So those were some of the two main points that we had within our ordinance that were struck down by the federal district judge.

MR. GILL BOEHRINGER: Well, it was a good effort and you really have something to be proud of. And it must be a really good feeling that others are going down the same route.

MR. JOHN OLIVAS: Yes, most definitely. You know, there's many small communities.

You hear of the stories at the state level of, you know, states like Maryland and New York are doing but there are many communities across the country, there's even communities in Texas that have taken a similar stance.

And Oklahoma, we all know what's going on in Oklahoma with all the earthquakes that are happening as a result of some of the fracking that's taking place. That's happening here in northern New Mexico in -- you know, 100 miles from us there is earthquakes that are happening within New Mexico as well due to the fracking process.

MR. GILL BOEHRINGER: And lastly you mentioned the commissioners, having seen what happened to the ordinance are now taking, I think the second choice that you mentioned, regulation. And from what you say it would appear that attempting to regulate the companies just hasn't worked and that there are now really bad serious impacts from the fracking, is that right?

MR. JOHN OLIVAS: Yeah. Well, here in New Mexico there is an oil and gas industry, an association that actually monitors and regulate oil and

gas across the state of New Mexico.

If you do some of the research there's spills all the time. There's depletions that are happening within the aquifer. And what's going on is that the current county commission is setting a regulatory ordinance that is supposedly supposed to be so restrictive that oil and gas will not come in.

In my opinion, once the oil and gas industry is profitable they're coming.

MR. GILL BOEHRINGER: Yes. I'm sure you're right. Thanks very much and good luck.

MR. JOHN OLIVAS: Thank you so much for your time.

MS. LISA MEAD: Thank you very much, John. I appreciate you joining us today.

And just to say that tomorrow Mari Margil, from the Community Environmental Legal Defense Fund will be talking more about these local ordinances in the USA. So there will be a chance to ask her questions about some of the technicalities of them.

And I understand that the judgment in -- the federal judge that presided over the case in New Mexico was a 199 page judgement that came out from that particular case.

MR. GILL BOEHRINGER: Well, at least they

made them work.

MS. LISA MEAD: It's time for us to sum up today's session. So just to recap and just going back briefly to the **CORRECTION NEEDED** â. What does this document seek to do?

Well, essentially, it asserts the rights of all of the earth's community to exist and to thrive and to evolve. And it represents the agreed values of thousands upon thousands of members of civil society and represents the core legal principles and growing cultural norms of the Rights Of Nature Movement.

And since its adoption in Cochamamba, Bolivia with over -- now over 850,000 individuals have signed the Rights Of Mother Earth petition, which is calling for the UN to adopt a Universal Declaration of the Rights of Mother Earth.

And we argue that based on the evidence that we're presenting, both here and in our earlier written submissions to the PPT, that various articles of the Universal Declaration of the Rights of Mother Earth are being violated by the unconventional oil and gas extraction.

And so to recap briefly on some of the evidence that we've presented today we heard from Linda Sheehan about the vast area of land in the USA affected

by unconventional oil and gas extraction and she mentioned that there are 680,000 known waste water wells across the US and they contain over 1600 chemicals, many of which have never been tested.

And Linda also explained how cheap shale gas is leading to a boom in plastics production just at a time when we're understanding that the damaging affects of plastic on nature and trying to reduce the plastics in the environment.

And then from Michelle Bamberger, a veterinarian and researcher also from the USA, we learned about her studies on the impacts of fracking on farm and domestic animals and how they are suffering from reproductive and respiratory issues with one notable case she mentioned, a large group of animals suddenly dying after drinking contaminated fracked water within a hour of drinking it.

And in our written submission we've also noted the cases in Canada where hundreds of migrating birds had to be euthanized after landing in toxic shale oil tailing ponds which are corresponding an area of some 98 square miles in Alberta.

And so, David Paul, an ecologist in Australia who researches threatened species, from him we heard that there have not been any direct studies done on the

impacts of methane contamination on native animals, however, with over one million hectares being affected by a fracking -- not fracking, but coal seam gas extraction in the Surat Basin in eastern Australia alone, which is where David Paul and his colleagues focused, then you add to that this unconventional gas extraction in the Bowen Basin, the Cooper Basin and areas of New South Wales and possibly the Northern Territories about to be exploited, this is a huge area of land with biodiversity being affected.

So he also informed us that the impacts of coal seam gas extraction on biodiversity are significant.

For example, the Brigalow Belt in Queensland is a hot spot for biodiversity, one of the most over-affected regions which has a lot to do with past activities and clearing of land and now due to ongoing drought and climate change.

And from what Dr. Paul, what he's witnessed, is that they have started to clear remnant areas to prepare them for unconventional gas operations and in doing so they're fragmenting them consequently reducing the resilience of those areas and opening up them up to things like feral predators and invasive weeds.

He talked about the main impacts from the

infrastructure developments from the construction of pipelines, roadways, processing plants, water treatments facilities and other depots for water storage.

And he talked about having a field -- if you have a thousand wells that's a massive area of impact on nature. And the fact that they've not really considered the indirect impact on nature just because of the way the approvals are given they're not really required. The companies are not actually required to take into account the indirect impact which include air pollution, on-site and off-site water pollution, light pollution affecting the patterns of nocturnal animals potentially with huge light pollution in these areas. And also huge amounts of noise going on all through the day and night.

Our last witness, or second to last witness I should say, Dr. Gavin Mudd who specializes in environmental engineering in Australia, has researched the impacts of coal seam gas on waterways and ground water in the Surat Basin and also in the Condamine River.

He has shown that there is insufficient research to understand if or how any of the damaged aquifers or waterways can, in fact, ever be repaired. And testimony from both David Paul and Gavin Mudd show the extreme lack of baseline data so the picture of how

things have changed since the gas industry began operations doesn't exist either by biodiversity or water systems.

When rivers catch fire, as the Condamine River has done because of methane bubbling up into the water system, then something is clearly very wrong. The rights of nature have been violated. Most worryingly no one knows if the ecosystems in question can be restored.

So we assert that the evidence demonstrates that the fundamental rights of native plants and animals and livestock animals to exist, to thrive and to evolve are being violated by unconventional oil and gas extraction.

And in terms of rivers, aquifers and water-ways we asserts that the evidence we've heard today and the evidence contained in our written submissions show that the fundamental rights of rivers, aquifers and waterways have been violated in North America, Australia and other jurisdictions, where unconventional oil and gas extraction takes place.

Given the intrinsic rights of waterways to flow, to be healthy, to support life and to continue their evolutionary journey and based on the Universal Declaration of the Rights of Mother Earth we assert that unconventional oil and gas extraction violates the

following rights of rivers, waterways and the biodiversity within the water ways in the following specific ways.

So the violation of the Right To Continue Their Vital Cycles And Processes Free From Human Disruptions, Article 2.1(c) of the UDRME;

And the violation of the Right To Integral Health, Article 2.1(g);

and violation of the Right To Be Free From Contamination, Pollution And Toxic Or Radioactive Waste, which is Article 2.1(h).

And we would like to invite the Tribunal to consider this evidence and what we are asserting.

And tomorrow we will continue with looking more specifically at seismic impact, impacts on the climate and my colleague Michelle Maloney will be leading that particular session. I will also be present and we will sum up together.

So thanking you kindly for your attention today and looking forward to seeing you tomorrow in the next session. Thank you.

MR. GILL BOEHRINGER: Thank you.

MS. LISA MEAD: And if you have any questions we close -- well, we're almost on the button but, yeah, there could be time for one question maybe.

No?

Then we'll close. Wishing you the best rest of the day or evening and we'll see you tomorrow.

[youtube.com/watch?v=pV3oUEaouQo]